COMSPHERE 3550 SERIES DATA SERVICE UNITS MODELS 3550 AND 3551

USER'S GUIDE

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PARADYNE™

COMSPHERE 3550 Series
Data Service Units
Models 3550 and 3551

User's Guide
3550-A2-GB20-30

4th Edition (March 1999)

Changes and enhancements to the product and to the information herein will be documented and issued as a new release.

United States

FCC Registration number: AW292J-61661-DD-N
PSTN Ringer Equivalence number (REN): DBM option 0.7B

Canada

V.32 Dial Backup Module
Certification number: 230 3684 A
DOC Load number: 7

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⚠ Important Safety Instructions

1. Read and follow all warning notices and instructions marked on the product or included in the manual.
2. This product is intended to be used with a 3-wire grounding type plug – a plug which has a grounding pin. This is a safety feature. Equipment grounding is vital to ensure safe operation. Do not defeat the purpose of the grounding type plug by modifying the plug or using an adaptor.

   Prior to installation, use an outlet tester or a voltmeter to check the ac receptacle for the presence of earth ground. If the receptacle is not properly grounded, the installation must not continue until a qualified electrician has corrected the problem.

   If a 3-wire grounding type power source is not available, consult a qualified electrician to determine another method of grounding the equipment.
3. Slots and openings in the cabinet are provided for ventilation. To ensure reliable operation of the product and to protect it from overheating, these slots and openings must not be blocked or covered.
4. Do not allow anything to rest on the power cord and do not locate the product where persons will walk on the power cord.
5. Do not attempt to service this product yourself, as opening or removing covers may expose you to dangerous high voltage points or other risks. Refer all servicing to qualified service personnel.
6. General purpose cables are provided with this product. Special cables, which may be required by the regulatory inspection authority for the installation site, are the responsibility of the customer.
7. When installed in the final configuration, the product must comply with the applicable Safety Standards and regulatory requirements of the country in which it is installed. If necessary, consult with the appropriate regulatory agencies and inspection authorities to ensure compliance.
8. A rare phenomenon can create a voltage potential between the earth grounds of two or more buildings. If products installed in separate buildings are **interconnected**, the voltage potential may cause a hazardous condition. Consult a qualified electrical consultant to determine whether or not this phenomenon exists and, if necessary, implement corrective action prior to interconnecting the products.

In addition, if the equipment is to be used with telecommunications circuits, take the following precautions:

– Never install telephone wiring during a lightning storm.
– Never install telephone jacks in wet locations unless the jack is specifically designed for wet locations.
– Never touch uninsulated telephone wires or terminals unless the telephone line has been disconnected at the network interface.
– Use caution when installing or modifying telephone lines.
– Avoid using a telephone (other than a cordless type) during an electrical storm. There may be a remote risk of electric shock from lightning.
– Do not use the telephone to report a gas leak in the vicinity of the leak.

Notices

WARNING

THIS EQUIPMENT HAS BEEN TESTED AND FOUND TO COMPLY WITH THE LIMITS FOR A CLASS A DIGITAL DEVICE, PURSUANT TO PART 15 OF THE FCC RULES. THESE LIMITS ARE DESIGNED TO PROVIDE REASONABLE PROTECTION AGAINST HARMFUL INTERFERENCE WHEN THE EQUIPMENT IS OPERATED IN A COMMERCIAL ENVIRONMENT. THIS EQUIPMENT GENERATES, USES, AND CAN RADIATE RADIO FREQUENCY ENERGY AND, IF NOT INSTALLED AND USED IN ACCORDANCE WITH THE INSTRUCTION MANUAL, MAY CAUSE HARMFUL INTERFERENCE TO RADIO COMMUNICATIONS. OPERATION OF THIS EQUIPMENT IN A RESIDENTIAL AREA IS LIKELY TO CAUSE HARMFUL INTERFERENCE IN WHICH CASE THE USER WILL BE REQUIRED TO CORRECT THE INTERFERENCE AT HIS OWN EXPENSE.

THE AUTHORITY TO OPERATE THIS EQUIPMENT IS CONDITIONED BY THE REQUIREMENTS THAT NO MODIFICATIONS WILL BE MADE TO THE EQUIPMENT UNLESS THE CHANGES OR MODIFICATIONS ARE EXPRESSLY APPROVED BY PARADYNE.

WARNING

TO USERS OF DIGITAL APPARATUS IN CANADA:

THE DIGITAL APPARATUS DOES NOT EXCEED THE CLASS A LIMITS FOR RADIO NOISE EMISSIONS FROM DIGITAL APPARATUS SET OUT IN THE RADIO INTERFERENCE REGULATIONS OF THE CANADIAN DEPARTMENT OF COMMUNICATIONS.

LE PRESÉNT APPAREIL NUMÉRIQUE N'ÉMET PAS DE BRUITS RADIOÉLECTRIQUES DÉPASSANT LES LIMITES APPLICABLES AUX APPAREILS NUMÉRIQUES DE LA CLASSE A PRESCRITES DANS LE RÈGLEMENT SUR LE BROUILLAGE RADIOÉLECTRIQUE ÉDICTÉ PAR LE MINISTÈRE DES COMMUNICATIONS DU CANADA.

Government Requirements

The Federal Communications Commission (FCC) requires that instructions pertaining to connection to the telephone network be included in the installation and operation manual. Specific instructions are listed in this section.

Notice to Users of the Digital Data Service

This equipment complies with Part 68 of the FCC rules. On the bottom of the equipment is a label or silk-screened text that contains, among other information, the FCC registration number and Ringer Equivalence Number (REN) for this equipment. If requested, please provide this information to your telephone company.

The REN is useful to determine the quantity of devices you may connect to your telephone line and still have all of those devices ring when your number is called. In most, but not all areas, the sum of the RENs of all devices should not exceed 5. To be certain of the number of devices you may connect to your line, as determined by the REN, you should call your local telephone company to ascertain the maximum REN for your calling area.

If your DSU causes harm to the telephone network, the telephone company may discontinue your service temporarily. If possible, they will notify you in advance. But if advance notice is not practical, you will be notified as soon as possible. You will be advised of your right to file a complaint with the FCC.

If your DSU causes harm to the telephone network, the telephone company may discontinue your service temporarily. If possible, they will notify you in advance. But if advance notice is not practical, you will be notified as soon as possible. You will be advised of your right to file a complaint with the FCC.

Your telephone company may make changes in its facilities, equipment, operations, or procedures that could affect the proper operation of your equipment. If so, you will be given advance notice so as to give you an opportunity to maintain uninterrupted service.

The DBM cannot be used on public coin-operated telephone service provided by the telephone company. Connection to party-line service is subject to state tariffs. (Contact the state public utility commission, public service commission, or corporation commission for information.)

No repairs may be performed by the user. Should you experience difficulty with this equipment, refer to the *Equipment Warranty and Support* section of Chapter 1.

For Digital Data Service (DDS) installations, inform the local telephone company of the appropriate network channel interface code for the service you desire.

DDS

Interface Code	Data Rate (bps)
04DU5-24	2400
04DU5-48	4800
04DU5-96	9600
04DU5-19	19,200
04DU5-56	56,000

The DDS Service Order Number is 6.0Y. The jack configurations required are RJ48S for the Model 3550 DSU and RJ48T for the Model 3551. With an RJ48T configuration, you must specify the number of data lines you require. Refer to the *Technical Specifications* section of Chapter 1 for V.32 DBM jack information.

After the telephone company has installed the requested jack, you can connect the DSU with the appropriate cable (provided). An FCC-compliant telephone cord and modular plug is provided with this equipment. This equipment is designed to be connected to the telephone network or premises wiring using a compatible modular jack that is Part 68 compliant.

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Preface

About This Guide

This user's guide provides the information needed to install and operate your COMSPHERE Model 3550 or 3551 Data Service Unit (DSU), which may or may not be equipped with a dial backup module (DBM) or time division multiplexer (TDM). If your DSU is not equipped with these options, skip the information that pertains to them.

Be sure to read the safety and regulatory information at the beginning of this guide.

It is assumed that you are familiar with the functional operation of digital data communications equipment.

How to Use This Guide

This guide provides basic information about your DSU, how to install it and verify that it is installed and operating correctly, how to operate the unit and its options, and how to configure it.

Two installation chapters are provided, one for the Model 3550 DSU and one for the Model 3551 DSU. Select the chapter that applies to your DSU.

Refer to the following chapters or appendices, as needed.

Chapter 1	Provides a general overview of the DSU and its options, information about equipment upgrades and conversions, and the unit's technical specifications. It also includes equipment warranty information and equipment return instructions.
Chapter 2	Provides step-by-step instructions for installing your standalone Model 3550 DSU.
Chapter 3	Provides step-by-step instructions for installing your carrier-mounted Model 3551 DSU.
Chapter 4	Describes how to operate your DSU and its DBM and TDM/Flex options.
Chapter 5	Presents the basics of setting and changing configuration options, and provides Configuration Option Set Tables, which describe each configuration option in an option set, along with its possible settings.
Appendix A	Provides a diagram for navigating the DSU's menu structure.
Appendix B	Summarizes the configuration option sets for you.
Appendix C	Lists the DSU's status indicators, as well as their messages, identifying when they appear.
Appendix D	Shows point-to-point and multipoint application configurations and network hookups.
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Related Documents

Other product documentation includes the following:

3000-A2-GA31	*COMSPHERE 3000 Series Carrier, Installation Manual*
3000-A2-GB41	*COMSPHERE –48 Vdc Central Office Power Unit, Installation Guide*
6700-A2-GB41	*COMSPHERE 6700 Series Network Management System, User's Guide, Security Manager Feature Supplement*
6700-A2-GY31	*COMSPHERE 6700 Series Network Management System, User's Guide*

Call your sales representative to order additional product documentation.

Paradyne documents are also available on the World Wide Web at **www.paradyne.com**. Select *Library* → *Technical Manuals.*

Reference Documents

- AT&T Technical Reference 41458
- AT&T Technical Reference 61330
- AT&T Technical Reference 62310 – 1987
- Bell Canada DCTE Specifications
- Bell Communications Research Technical Reference Publication 41028
- CCITT V.35 (ISO 2593)
- EIA-232-D/V.24 (ISO 2110)
- Integrated Network Corporation Compatibility Bulletin CB-INC-101
- Pacific Bell PUB L-780035-PB/NB
- Pacific Bell PUB L-780036-PB/NB

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Overview

The COMSPHERE Model 3550 or 3551 Data Service Unit (DSU) supports communication between computers and other data processing devices by providing connections to digital data service (DDS) transmission facilities. Both point-to-point and multipoint configurations are supported.

The following sections describe the standard features of the DSU, as well as the features of the options that may have been ordered with your unit. The technical specifications of the DSU and its orderable options are near the end of the chapter.

Standard Features

The Model 3550 or 3551 DSU offers the following features:

- **Multispeed operation.** The DSU operates at data rates of 2.4, 4.8, 9.6, 19.2, 38.4, and 56 kbps full-duplex over the digital data service (DDS) network.

  Two DTE connectors (interfaces) are provided for Port 1: **EIA-232-D** and **V.35**. Use the EIA-232-D connector for data rates up to and including 19.2 kbps; use the V.35 connector for higher rates.

- **Rate Adaption.** With this feature, the DSU can adapt its data rate to a low-speed application while operating over the high-speed DDS circuit.

- **LADS operation.** The DSU can operate as a local area data set (LADS) (sometimes called a limited-distance modem, or LDM) at 2.4, 4.8, 9.6, 19.2, 38.4, 56, or 64 kbps.

- **Single-Port Async/Sync.** The single-port asynchronous-to-synchronous feature makes it possible to send asynchronous data over the synchronous network.

- **Nondisruptive Diagnostics.** When set up to use nondisruptive diagnostics, the DSU sends diagnostic data without interrupting or disrupting customer data.

- **NMS control.** The DSU can be controlled by COMSPHERE 6700 Series NMS. The 6700 Series NMS operates using Advanced Diagnostic protocol (ADp).

  The Model 3550 DSU requires a hubbing device for connection to the NMS; the Model 3551 DSU is connected to the NMS through the shared diagnostic unit (SDU) in the COMSPHERE 3000 Series Carrier.

- **Diagnostic Control Panel control.** The Model 3550 DSU is controlled from its diagnostic control panel (DCP). The diagnostic control panel for the Model 3551 DSU, called a shared diagnostic control panel (SDCP), is installed in the 3000 Series Carrier. Both control panels display information about the DSU on a 2-line, 16-character liquid crystal display (LCD) and through light-emitting diode (LED) status indicators.

> **NOTE**
>
> Except where a distinction is made, the term **DCP** refers to both types of diagnostic control panels, the DCP or the SDCP.

- **Full tributary diagnostics.** The DSU supports a full complement of diagnostic tests and commands. Diagnostics can be addressed to and sent to tributaries from a 6700 Series NMS workstation or from the DCP of a control DSU.
- **External dial backup.** The DSU can use an *extern*al dial backup unit (DBU – e.g., a 3800 Series dial/lease modem) to provide backup. This feature may be used in a point-to-point DSU configuration and can be used with either a control or tributary DSU.

For more information about the 3000 Series Carrier or the SDCP, refer to the *COMSPHERE 3000 Series Carrier, Installation Manual*. For more information about the 6700 Series NMS, refer to the *COMSPHERE 6700 Series Network Management System, User's Guide*. These are identified in the *Related Documents* section of the *Preface*, which also provides information on how to order these documents.

Optional Features

The Model 3550 DSU can be ordered with the following optional features:

- V.32bis 14.4 kbps Dial Backup Module (DBM)
- Time Division Multiplexer (TDM/Flex)

The Model 3551 DSU can be ordered with a V.32bis 14.4 kbps DBM, or it can be used with an *external* DBU.

If your DSU is not equipped with these options, go to the next section.

V.32 DBM

The V.32bis 14.4 kbps dial backup module (referred to as DBM throughout this guide) childboard is attached to the DSU circuit card. The DBM provides the following features:

- **Multispeed point-to-point backup.** The DBM provides point-to-point service over the 2-wire dial network. Backup rates available are 2.4, 4.8, 9.6, 12.0, and 14.4 kbps.
- **Independent operation.** Although the DBM is installed on the DSU, the two are configured separately and most tests can be run on either independent of the other (e.g., you can run a test on the DBM while a test is running on the DSU).
- **Security.** There are four levels of call setup security: None, Password, Callback, and Alarm.
- **Management control.** Dial backup can be initiated from a 6700 Series NMS, the DSU's DCP, or it can be initiated automatically by the DSU-DBM.
- **Automatic setup and restoration.** When configured for automatic backup, the DSU-DBM initiates dial backup when it detects a failure in the network, then restores the data path to the DDS circuit when the network returns to service.

2-Port TDM/Flex

The 2-port TDM/Flex is a separate circuit card that attaches to the Model 3550 DSU. It allows independent ports to share one standard digital point-to-point facility. The 2-port TDM/Flex provides the following features:

- **Port capacity.** This feature permits the DSU to operate as a digital sharing device and provides two independent ports. Port 1 is on the DSU and Port 2 is on the 2-port TDM/Flex. Either port can operate as an EIA-232 or V.35 interface.
- **Multiplexing.** With this option, time division multiplexing can be performed using two independent ports to share one standard DDS point-to-point circuit.
- **Line speeds.** The TDM/Flex operates at all line speeds supported by the DSU: 2.4, 4.8, 9.6, 19.2, 38.4, and 56 kbps. For LADS operation, 64 kbps is also supported.
- **Port speeds.** Each port can be set to 1.2, 2.4, 4.8, 9.6, 14.4, 19.2, 48, 56, or 64 kbps. *In 2-port TDM/Flex applications, the sum of the port speeds cannot exceed the line speed.*
- **Asynchronous operation.** Although the DSU provides synchronous transmission through the DDS network, any port can be configured for asynchronous operation. When the 2-port TDM/Flex is installed, asynchronous-to-synchronous conversion can be performed. Asynchronous data rates of 150, 300, 600, 1200, and 1800 bps are supported, along with the synchronous data rates.
- **Digital sharing.** With this feature, the ports can share the same channel. All ports in a digital-sharing group operate at the same speed, and all receive the same data. When configured for DSD (digital-sharing device) port contention, only one port at a time is allowed to send.
- **Elastic store per port.** A transmit elastic store buffer is provided for each port for the support of extended circuits. Both digital and analog extensions are supported.
- **Switched-carrier emulation.** In 2-port TDM/Flex transmission, switched-carrier emulation is optional for each port, for both the inbound (toward the control DSU) and outbound (from the tributary DSU) directions.
- **NMS control.** Control of a 3550 DSU with 2-port TDM/Flex can be performed from a 6700 Series NMS or the DSU's DCP.
- **Point-to-point backup.** A 3550 DSU with 2-port TDM/Flex can also have a DBM installed for point-to-point dial backup. *If backup is at a different speed than the DSU's speed, TDM/Flex operation automatically changes to the lower speed.*

Upgrades Available

Although your DSU may not currently have a DBM or 2-port TDM/Flex installed, you can add these features at a later time. Both the DBM and 2-port TDM/Flex features are available as upgrades.

You can order the option you want and install it yourself (referred to as a field installation). Refer to the *Equipment List* in Appendix F for the feature number to order.

Technical Specifications

Tables 1-1 through 1-4 list the technical specifications for the following:

- General specifications that apply to all Model 3550 and 3551 circuit cards (Table 1-1)
- Specifications for the Model 3550 and 3551 DSU only (Table 1-2)
- Specifications for the V.32 DBM (Table 1-3)
- Specifications for the 2-port TDM/Flex – only used with a Model 3550 (Table 1-4)

Table 1-1
(1 of 2)
General Technical Specifications

Specifications	Criteria
APPROVALS	
FCC Part 15	Class A digital device
FCC Part 68	AW292J-61661-DD-N
UL	
3550 DSU	Listed U L 1950, second edition
3551 DSU, 3000 Series Carrier	Recognized Component UL 1950, second edition
CSA	
Safety	
3550 DSU	Certified CSA 22.2, No. 950-M89
3551 DSU, 3000 Series Carrier	Certified Component CSA 22.2, No. 950-M89
Emissions	CSA 108.8 – M1983, Class A digital apparatus
Bell Canada	"DCTE Specifications," July 1989, Issue 1
AC POWER REQUIREMENTS	
3550 DSU	24 Vac (CT), 60 Hz ±3 (0.093 amp, 5.8 watts at 115 Vac)
3550 DSU with DBM	24 Vac (CT), 60 HZ ± 3 (0.115 amp, 9.5 watts at 115 Vac)
3550 DSU with 2-Port TDM/Flex	24 Vac (CT), 60 Hz ±3 (0.103 amp, 8.6 watts at 115 Vac)
3551 DSU	24 Vac (CT), 60 Hz ±3 (0.029 amp, 4.5 watts at 115 Vac)
3551 DSU with DBM	24 Vac (CT), 60 Hz ±3 (0.080 amp, 8.0 watts at 115 Vac)
V.32 DBM	24 Vac (CT), 60 Hz ±3 (0.024 amp, 2.0 watts at 115 Vac)
3000 Series Carrier (16 DSUs with DBMs plus SDU and fan module)	90—132 Vac, 60 Hz ±3 (1.650 amp, 165 watts at 115 Vac)
DTE INTERFACE	
3550 DSU	
25-pin D-subminiature connector 34-pin connector	EIA-232-D/ITU-T V.24 (ISO 2110) ITU-T V.35 (ISO 2593)
3551 DSU with 25-Pin V.35 Interface	EIA-232-D/ITU-T V.24 (ISO 2110) ITU-T V.35 (ISO 2593)
Uses a Rear Connector Plate with two 25-pin D-subminiature connectors.	(A V.35 adapter is required to use the V.35 connector. The adapter provides an interface between the DSU's 25-pin D-type connector and the DTE cable's V.35 connector.)
ENVIRONMENT	
Operating Temperature	32° to 122° F (0° to 50° C)
Storage Temperature	–4° to 158° F (–20° to 70° C)
Relative Humidity	5%—95% (noncondensing)
Shock and Vibration	Withstands normal shipping and handling

Table 1-1
(2 of 2)
General Technical Specifications

Specifications	Criteria
HEAT DISSIPATION (MAX.) AT 115 VAC	
3550 DSU	22.16 Btu/hr
3550 DSU with DBM	29.00 Btu/hr
3550 DSU with 2-Port TDM/Flex	29.21 Btu/hr
3551 DSU	22.16 Btu/hr
3551 DSU with DBM	27.30 Btu/hr
3000 Series Carrier (16 DSUs with DBMs plus SDU and fan module)	563.00 Btu/hr
PORT RATES	Async or Sync rates: 64, 56, 48, 19.2, 14.4, 12.0, 9.6, 4.8, 2.4, and 1.2 kbps Other asynchronous rates (e.g., 150, 300, 600, and 1800 bps) can be obtained through oversampling Asynchronous rates support ITU-T V.14 extended rate range at 8 to 12 bits per character, including the *start* and *stop* bit (+2.3, –2.5 percent overspeed/underspeed compensation at 10 bits per character)
NMS COMPATIBILITY	COMSPHERE® 6700 Series NMS, Release 4.0 or greater

Table 1-2
DSU Technical Specifications

Specifications	Criteria
APPLICATION	Full- or half-duplex data transmission via point-to-point or multipoint DDS network, or local area data channel
COMMUNICATION LINE	Leased or private 4-wire DDS line
DATA RATES	
Digital Services (DDS, ASDS)	2.4, 4.8, 9.6, 19.2, 38.4, and 56 kbps
LADS	2.4, 4.8, 9.6, 19.2, 38.4, 56, and 64 kbps
When timing is external (provided by the DTE), the DTE's clock must be within these ranges.	64 kbps ± 11 bps 56 kbps ± 9 bps 38.4 kbps ± 4 bps 19.2 kbps ± 5 bps 9.6 kbps ± 1 bps 4.8 kbps ± 0 bps 2.4 kbps ± 0 bps
DDS NETWORK INTERFACE	
3550 DSU	8-pin modular jack, USOC RJ48S
3551 DSU	(One or two) 50-pin connector, USOC RJ48T
DIAGNOSTIC INTERFACE	
3550 DSU	Requires 3600 Series Hubbing Device which provides two 8-pin modular jacks
3551 DSU	Via the SDU in the COMSPHERE® 3000 Series Carrier
NETWORK COMPATIBILITY	
AT&T Technical Reference 62310 – 1987	2.4, 4.8, 9.6, and 56 kbps
Integrated Network Corporation Compatibility Bulletin CB-INC-101, and Pacific Bell publications PUB L-780035-PB/NB and PUB L-780036-PB/NB	19.2 kbps loop at levels of +6, 0, or –10 dBm
DSU COMPATIBILITY	
Primary Channel	All Paradyne digital products and other products that are compliant with AT&T Technical Reference 62310 – 1987

Table 1-3
V.32 DBM Technical Specifications

Specifications	Criteria
RINGER EQUIVALENCE NUMBER (REN)	DBM option 0.7B
APPLICATION	Full- or half-duplex data transmission via analog 2-wire dial network, point-to-point
MODULATION AND FREQUENCY	At 14.4 and 12 kbps: ITU-T V.32bis, 1800 Hz At 4.8 and 9.6 kbps: ITU-T V.32, 1800 Hz At 2.4 kbps: ITU-T V.22bis, 2400 Hz
COMMUNICATION LINE	2-wire analog (PSTN) line
DATA RATES	2.4, 4.8, 9.6, 12, 14.4 kbps
DBM COMPATIBILITY	If Call Setup is set for Callback or Password security, then the device is compatible with a Model 3550 or 3551 V.32 DBM. If Call Setup is set for Alarm or None, then *any* V.32 modem can be used. Also, V.22bis at 2.4 kbps can be used.
APPROVALS DOC Certification (PSTN) Load Number	 230 3684 A 7
RECEIVE VF INTERFACE Dynamic Range V.32 2-wire PSTN Impedance	 –43 to –10 dBm 600 Ω
SWITCHED NETWORK INTERFACE 3550 DSU 3551 DSU	 6-pin modular jack Permissive: USOC RJ11C 8-pin modular jack Programmable: USOC RJ45S (One or two) 50-pin connector Permissive: USOC RJ21X Programmable: USOC RJ27X
TRANSMIT VF INTERFACE Signal Level V.32 2-wire Dial (PSTN) Impedance	 Permissive: –9 dBm Programmable: –12 to 0 dBm (set by a resistor in the telco jack) 600 Ω

Table 1-4
2-Port TDM/Flex Technical Specifications

Specifications	Criteria
APPLICATION	
Multiplexing	Provides time division multiplexing of two independent ports.
Digital sharing	Allows consecutive ports to share the same TDM/Flex channel.
PORT SYNCHRONOUS RATES	1.2, 2.4, 4.8, 9.6, 12.0, 14.4, 19.2, 48, 56, and 64 kbps
PORT ASYNCHRONOUS RATES	150, 300, 600, 1200, and 1800 bps plus all primary (DSU) rates. Asynchronous rates support +2.3, –2.5 percent overspeed/ underspeed compensation.
PORT DTE INTERFACE	
3550 DSU (2-port TDM/Flex)	Provides an additional 25-pin D-subminiature connector for a total of two EIA-232 or V.35 interfaces.
NMS SUPPORT	TDM/Flex capability is fully supported by Release 4.0 or greater COMSPHERE 6700 Series NMS.

Equipment Warranty and Support

Contact your sales or service representative directly for any help needed. For additional information concerning warranty, sales, service, repair, installation, documentation, or training, use one of the following methods:

- **Via the Internet:** Visit the Paradyne World Wide Web site at http://www.paradyne.com
- **Via Telephone:** Call our automated call system to receive current information via fax or to speak with a company representative.
  - — Within the U.S.A., call 1-800-870-2221
  - — Outside the U.S.A., call 1-727-530-2340

Installing the Model 3550 DSU 2

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Overview

The Model 3550 DSU is designed for desktop operation and is delivered ready to connect to the network. It is configured as a tributary DSU for operation at 9.6 kbps on a multipoint circuit.

If the unit was ordered with a TDM/Flex installed, Ports 1 and 2 are configured for 9.6 kbps operation, and configured as a digital sharing device (DSD). Both ports are configured for EIA-232 operation, rather than V.35 operation. Refer to the MUX (Port) option set tables in Chapter 5 to change this configuration on a port-by-port basis.

Installation consists of the following steps, which should be performed in the order listed.

- Physical installation
- Hardware straps
- Electrical connection
- Network diagnostic connection
- Software configuration
- DDS network (or LADS) connection
- Dial (or PSTN) network connection if a DBM is installed, or if using an *external* dial backup unit (DBU)
- DSU DTE connection
- Verification testing

Although the Model 3550 DSU is designed for desk or table-top operation, you can order an ACCULINK® 3100 Series CSU wall-mount adapter if you want to mount the DSU on a wall, an equipment shelf, a 19-inch RS-310-C or 23-inch AT&T DATAPHONE® equipment cabinet. Refer to Appendix F to order the adapter.

Before You Begin

Your installation site should be clean, well-lighted, well-ventilated, and free from environmental extremes.

A dedicated grounded ac outlet that is protected by a circuit breaker should be installed within 6 feet of the DSU's planned location. The outlet should be capable of supplying 90 to 132 Vac 60 Hz (U.S. and Canada). The circuit must be capable of supplying a minimum of 2 amperes at 115 Vac. Refer to the *Technical*

Specifications section in Chapter 1 for additional power requirements.

CAUTION

The ac transformer contains a 3-wire grounding-type plug which has a grounding pin. This is a safety feature. Do not defeat the purpose of the grounding plug by modifying it or by using an adapter.

Prior to installation, use an outlet tester to check the ac receptacle for earth ground. If the power source does not provide a ground connection, consult an electrician to determine another method of grounding the DSU before proceeding with the installation.

Before connecting the DSU, you need to contact the telephone company to coordinate your installation before connecting the DSU to their network. The DSU can only be operated at the data rate for which access to the DDS network is provided. If a DBM is installed, the DSU must also be connected to the dial network. You must notify the telephone company before you connect to the dial network. *Refer to the notice at the front of this guide to ensure compliance with FCC, Bell Canada, and Canadian DOC rules.*

No on-site assembly of the DSU is required. However, installation should not proceed if any of the following is missing:

- A power cord with table-top ac transformer
- A 14-ft cable for connection to the DDS network, with 8-pin RJ48S modular plug on each end

For Canadian purchasers, an 8-pin RJ48S connector is on one end while a 6-pin connector is on the other is required (order feature number 3000-F1-006).

If the DSU is equipped with a DBM, a dial interface cable should have been ordered.

- Permissive (RJ11C) – a 6-pin modular plug at each end (feature number 4400-F1-53x or 3600-F3-503).
- Programmable (RJ45S) – an 8-pin modular plug at each end (feature number 4400-F1-54x).

Contact your service representative if any of these items is missing from the shipping container, or to order the appropriate dial interface cable.

If your DSU is equipped with a DBM, you may need to change the DSU's hardware straps before installing the DSU.

How to Change Hardware Straps

HANDLING PRECAUTIONS FOR STATIC-SENSITIVE DEVICES

This product is designed to protect sensitive components from damage due to electrostatic discharge (ESD) during normal operation. When performing installation procedures, however, take proper static control precautions to prevent damage to equipment. If you are not sure of the proper static control precautions, contact your nearest sales or service representative.

The Model 3550 DSU has a switch located behind its diagnostic control panel (DCP). This switch contains two straps, one that controls the permissive or programmable connection when a DBM is installed, and one that controls the frame-to-signal grounds. Table 2-1 shows the DSU's settings. Refer to Figure 2-1 and the following steps if you need to change one of these straps.

▶ Procedure

1. With your thumbs under the edge of the front bezel, firmly press upward to lift the bezel from the tabs securing it in place.
2. Swing the front bezel up and set the bezel aside.
3. Refer to Table 2-1 to determine which switch needs to be changed. Then, using a small instrument, carefully change the position of the switch.
4. Reinsert the front bezel's hinge tabs into position and swing the bezel down. Snap the bezel back into place.

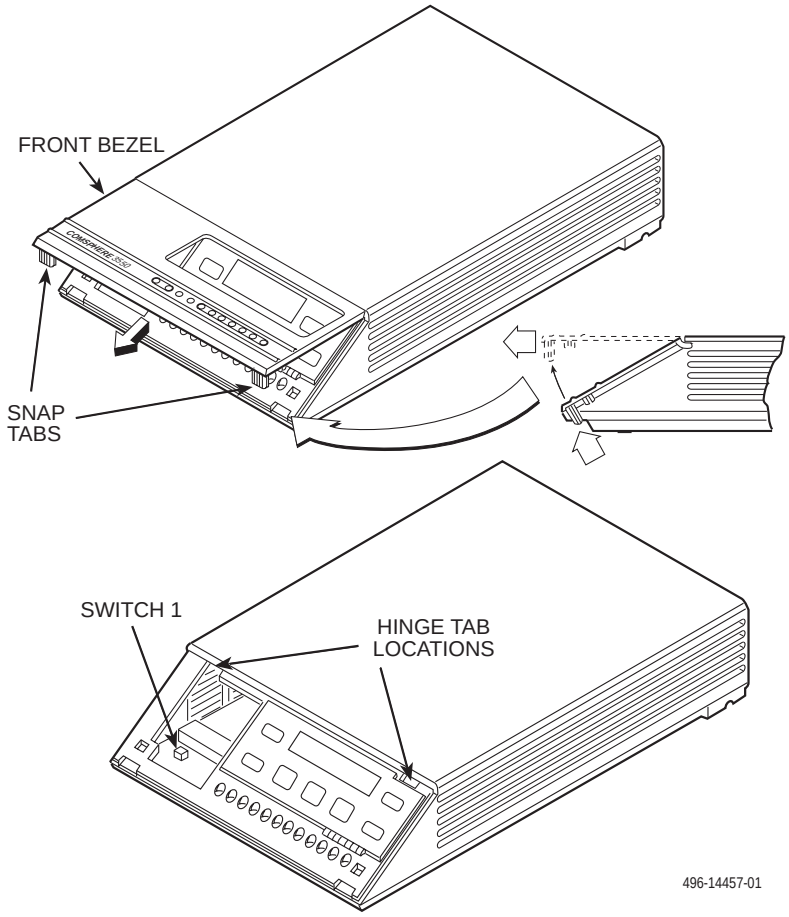

Figure 2-1. Model 3550 Hardware Switch Location (shown without a TDM/Flex)

Table 2-1
Model 3550 DSU Switch Settings

Switch Position	Switch Setting	Function
S1-1	ON (default)	Permissive V.32 DBM transmit output level of –9 dBm
	Off	Programmable V.32 DBM transmit level between –12 dBm and 0 dBm
S1-2	ON	Frame ground (FG) connected to signal ground (SG)
	Off (default)	FG connected to SG through 100 ohm resistor
ON is to the rear as you face the front of the DSU. Off is to the front.		

Where to Place the DSU

As mentioned earlier, the DSU must be placed within 6 feet of a dedicated grounded ac outlet that is protected by a circuit breaker.

The distance between the DSU and its DTE must be within EIA-232-D/V.24 limits, or V.35 limits if operating the DSU at speeds greater than 19.2 kbps.

- *For the EIA-232 connector*, the typical maximum distance is 50 feet at speeds less than or equal to 19.2 kbps. If a longer distance is needed, use high quality, low capacitance cable and ensure that the effective shunt capacitance of the circuit (measured at the DSU and including the capacitance of the cable and the DTE) does not exceed 2500 picofarads, as specified in EIA-232-D.
- *For the V.35 connector*, the maximum distance recommended between the DSU and the DTE is nominally 1000 feet.

Allow 1 to 2 feet of clearance around the DSU for access and cable connections during installation.

Installing the DSU

Before installing the DSU, label the circuit breaker that protects the ac wall outlet, and make sure that it is set to ON. Then, proceed with the installation.

▶ Procedure

1. Place the DSU in its planned location. Make sure the ventilation slots are not blocked.
2. At the rear of the DSU (Figure 2-2), insert the ac transformer, circular plug into the interface labeled **POWER**.
3. Plug the ac transformer's 3-prong plug into the ac wall outlet.

CAUTION

Only use the power transformer designed for the Model 3550 DSU. Using other transformers may result in personal injury or damage to the equipment.

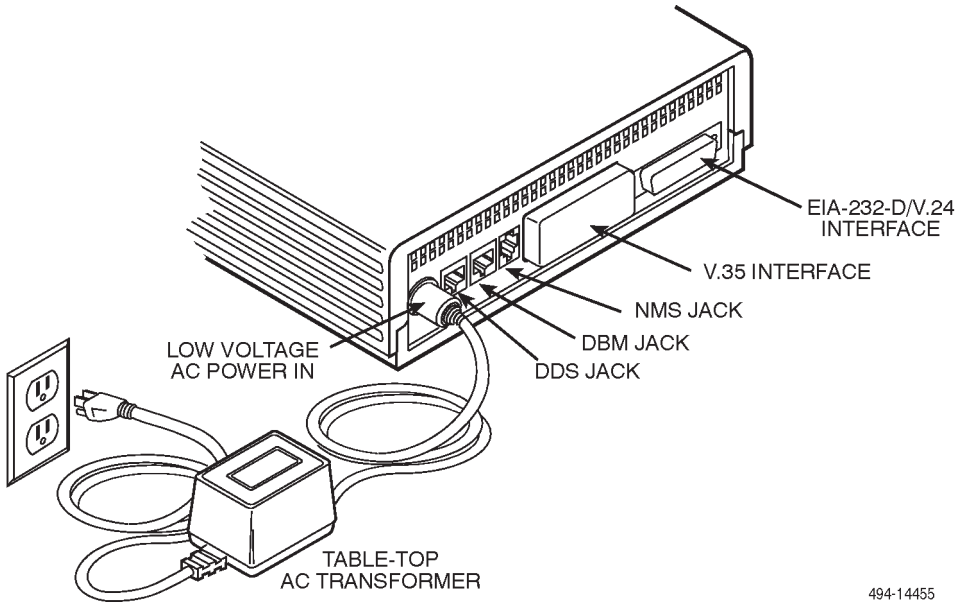

Figure 2-2. Model 3550 Electrical Connection

Power-Up Routine

When power is applied, the DSU:

- Determines what options (DBM or TDM/Flex) are installed, if any.
- Runs a Device Test on itself and each of the installed options.

  During the tests, all indicators on the DCP light briefly and the message *Power-Up Tests* appears on the liquid crystal display (LCD).
- Displays the results of each test momentarily as **Pass**, **Fail**, or **Abrt**. *(Abrt indicates that the Device Test was aborted because a network loopback was in progress during the power-up procedure*.) These tests take about 20 seconds to complete.

  If a TDM/Flex is installed, MUX is displayed as Pass or Fail.

If the DSU, DBM, or TDM/Flex (MUX) fails this test, follow these steps. Refer to Appendix A as you perform the procedures described in this guide. Refer to Chapters 4 and 5 for additional examples and procedures.

▶ Procedure

1. Press the ⏢ key to return to the top-level menu.
2. Select **Local** (F1 key).
3. Press the ▻ key to scroll the Confg (Configuration) branch into view.
4. Press the function key directly below **Confg**.
5. Press the F1 key to select **Opts** (Configuration Options).

   The *Load from* screen appears.
6. Press the ▻ key to bring the factory-loaded unit configurations into view, and select the appropriate configuration.
   - **PTPC** for a point-to-point control
   - **PTPT** for a point-to-point tributary
   - **MPTC** for a multipoint control
   - **MPTT** for a multipoint tributary
7. Press the F1 key to **SAVE** the selected configuration.

   The *Save to* screen appears.
8. Save the selected configuration to **Activ** (F1 key).
9. Press the ⏢ key to return to the top-level menu, then select **Local** again.
10. Select **Test** (F3).

    The *Run Test on* screen appears.
11. Select the device that Failed: the DSU (or the TDM/Flex) or DBM.
12. Press the F2 key to run the Device Test again.

    The device should pass.
13. Should the device fail, call your service representative. (see Chapter 1).

Connecting to the Network

The DSU provides three interfaces (often called a *jack*). One jack connects the DSU to the 6700 Series NMS, one connects the DSU to the dial (or public switched telephone network – PSTN) network, and one connects the DSU to the DDS network. Follow the appropriate procedure when making your network connections.

Connecting to the NMS

A 3600 Hubbing Device is required to connect the control DSU to the 6700 Series NMS. When connected to the NMS, the DSU can be controlled and configured from the NMS rather than from the DCP alone.

▶ Procedure

1. Plug the 4-pin modular plug of the 3600 Hubbing Device (Figure 2-3) into the DSU jack labeled **CC/DC**.
2. Plug one end of an M6BJ cable into the hubbing device jack labeled **CC IN/DC OUT**.
3. Plug the other end of the 8-pin M6BJ cable into the 8-pin end of the 873A adapter.
4. Plug the D-type end of the 873A adapter into the appropriate 6700 Series NMS jack.

Refer to your COMSPHERE 6700 Series NMS documentation to control and configure the DSU from the NMS.

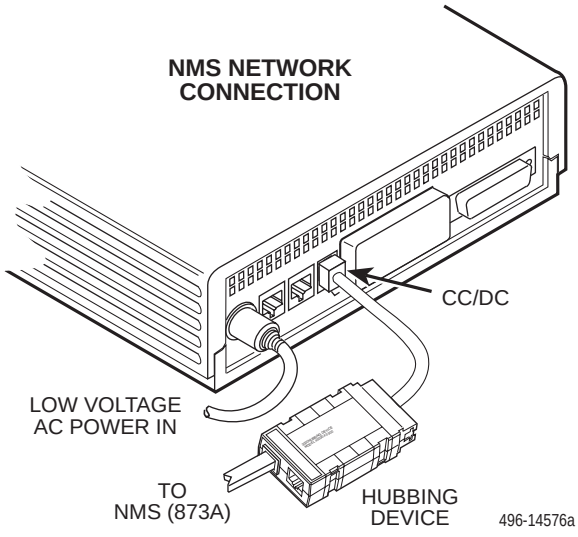

Figure 2-3. Model 3550 DSU NMS Connection

Connecting to the Dial (or PSTN) Network

If your DSU is equipped with a V.32 DBM, refer to Figure 2-4 as you follow these steps.

▶ Procedure

1. Plug either end of the dial (analog) interface cable into the DSU jack labeled **BACKUP**.
   - *Permissive service* – telephone cord with 6-pin modular RJ11C plug
   - *Programmable service* – telephone cord with 8-pin RJ45S plug
2. Plug the other end of the cable into the modular jack provided by the telephone company, USOC RJ11C (permissive) or USOC RJ45S (programmable).
3. If your site has programmable service, verify that the DSU's hardware strap S1-1 is switched to the OFF position.

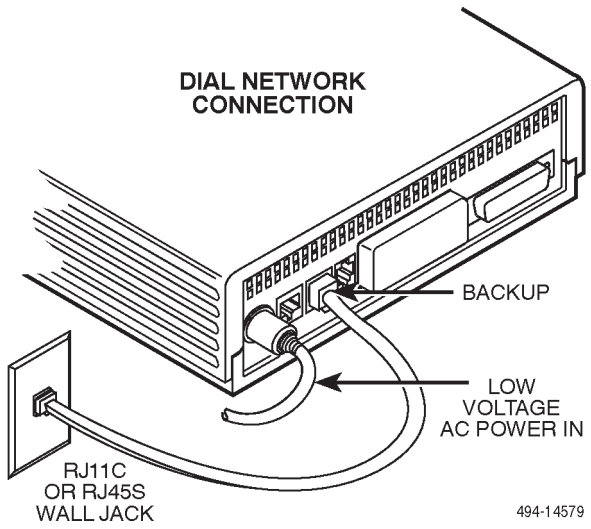

Figure 2-4. Model 3550 DSU Dial (PSTN) Network Connection

Connecting to the DDS (or LADS) Network

> **NOTE**
>
> Before connecting the DSU to the DDS network, ensure that approved primary protectors have been installed on the circuit in accordance with Article 800 of the National Electric Code, NFPA 70, in the United States and Section 60 of the Canadian Electric Code, Part 1, in Canada.

Refer to Figure 2-5 as you follow these steps.

▶ Procedure

1. Plug the DDS network interface cable into the DSU jack labeled **LINE**.
   - U.S. – select either end of the cable
   - Canada – select the 8-pin end
2. Plug the other end of the cable into the modular jack (USOC RJ48S) provided by the circuit provider.

If the remote DSU is also connected to the network, the DSU's green **OK** indicator lights and the **Alrm** indicator goes off. The Health and Status screen no longer displays a *No Signal* message.

If connecting the DSU to a LADS network, there are distance limitations that govern the use of DSUs on the network. Table 2-2 summarizes these limitations.

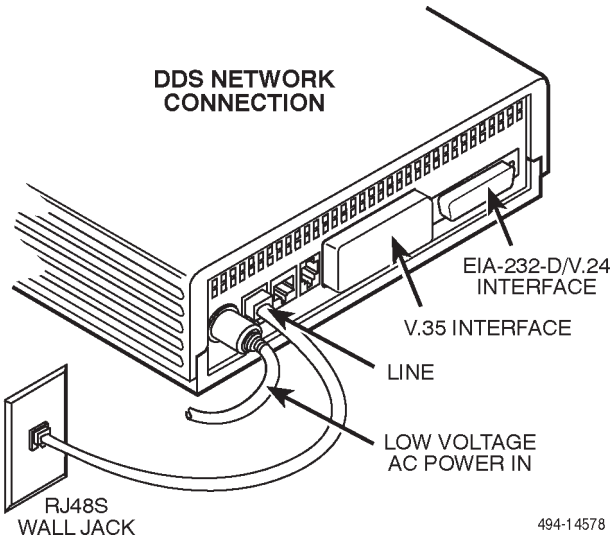

Figure 2-5. Model 3550 DSU DDS (LADS) Network Connection

Table 2-2
LADS Connection Distances

Data Rate (kbps)	Wire Gauge (AWG)			
	19	22	24	26
2.4	20.0 mi (32.2 km)	16.6 mi (26.7 km)	12.7 mi (20.5 km)	9.4 mi (15.1 km)
4.8	19.4 mi (31.2 km)	12.7 mi (20.5 km)	9.6 mi (15.4 km)	7.1 mi (11.5 km)
9.6	15.2 mi (24.5 km)	9.7 mi (15.6 km)	7.3 mi (11.7 km)	5.6 mi (9.0 km)
19.2[1]	11.8 mi (19.0 km)	7.5 mi (12.1 km)	5.7 mi (9.2 km)	4.2 mi (6.8 km)
38.4	11.2 mi (18.0 km)	6.5 mi (10.5 km)	4.6 mi (7.4 km)	3.2 mi (5.1 km)
56	9.2 mi (14.8 km)	5.4 mi (8.7 km)	3.8 mi 6.2 km)	2.8 mi (4.5 km)
64	9.2 mi (14.8 km)	5.4 mi (8.7 km)	3.8 mi (6.2 km)	2.8 mi 4.5 km)

[1] Power level is –10 dBm.

Addressing the Unit

A unique address must be assigned to each control and tributary DSU in your network. You can assign an address within the range of 1 through 255.

NOTE

Do **not** assign the number **192** as a network address. This number is reserved as a broadcast address.

If a DBM is installed, it requires a separate address which is automatically assigned by the DSU. The address assigned a DBM is the DSU's address, plus 1 (e.g., if the DSU's address is 1, the assigned DBM address will be 2).

NOTE

The numbers **191** and **255** cannot be assigned to a DSU that has a DBM. However, addresses can be assigned in any order; they do not have to be sequential.

It is recommended that only *odd-numbered* addresses be assigned to DSUs so that *even-numbered addresses* are reserved for DBMs. If your network does not currently include DBMs, you retain the flexibility to add them later without having to reconfigure your entire network.

Tributary DSU Addressing

Tributary DSU addresses are user-definable, but take care that their addresses are unique on a multipoint circuit. *If two tributaries are assigned the same address, you will not be able to communicate with either one*.

The control DSU accesses its tributary by specifying the tributary's address.

The 6700 Series NMS accesses the DSU via its network address. *To access a tributary DSU*, the NMS first addresses the control, then the tributary. An address issued from the NMS takes the format of control channel/control network address/tributary network address. This is called *link-level network addressing*.

Figure 2-6 shows an example of DSU and DBM addressing, as well as link-level network addressing.

Refer to Chapter 4 to learn how to set the DSU's network address.

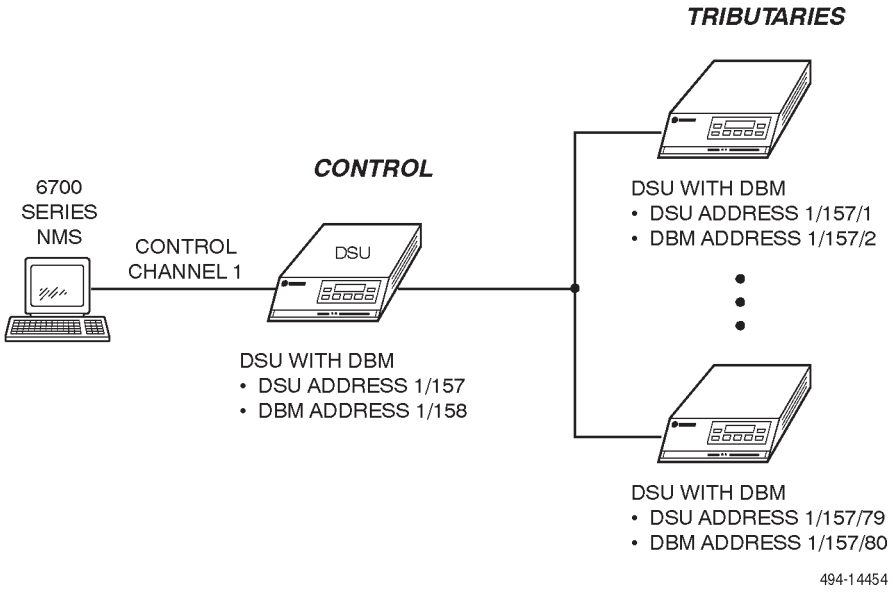

Figure 2-6. Addressing Example

Connecting the DSU to a DTE

The DSU's rear panel has both a 25-pin EIA-232-D/V.24 connector and a 34-pin ITU-T V.35 connector (used for higher operating speeds). You can use *either* interface.

When the unit is equipped with a TDM/Flex, either of these interfaces can be used as Port 1. The TDM/Flex provides an additional interface to be used as Port 2. This is a D-type connector. If the port is to operate at a speed greater than 19.2 kbps, use the V.35 adapter to provide an interface between the TDM/Flex's D-type connector and the DTE cable's V.35 connector.

Figure 2-7 shows a DSU as well as a DSU equipped with a TDM/Flex. The DSU without TDM/Flex illustrates cabling for an EIA-232 application; the DSU with TDM/Flex illustrates cabling for V.35 applications. Refer to this figure as you connect your DSU to the data terminal equipment (DTE). Be sure to select the appropriate cable, EIA-232 or V.35, for your application.

▶ Procedure

1. Connect the plug end of the DTE cable to Port 1, either the EIA-232-D or the V.35 connector. (Figure 2-7 shows Port 1 using the EIA-232-D connector.)

   Tighten the two holding screws.

2. Connect the other end of the cable to the appropriate port on the computer or DTE.

   Tighten any holding screws.

3. If necessary, activate the port to match the interface, either EIA-232 or V.35 (the default setting is EIA-232).

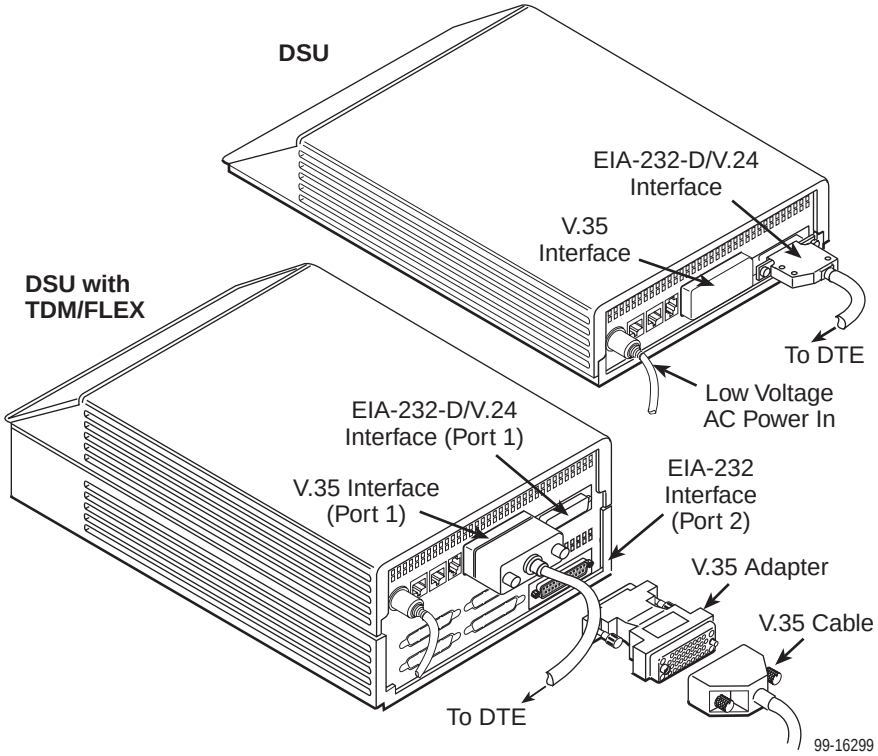

Figure 2-7. Installing Cables

Connecting Port 2

For the **EIA-232** cable, install as described above.

For the **V.35** cable, install the V.35 adapter, then the V.35 DTE cable as follows (refer to Figure 2-7).

▶ Procedure

1. Reconfigure the port to match the interface, V.35 in this example.
2. Connect the 25-pin plug end of the V.35 adapter (feature number 3000-F1-510) to Port 2.

   Tighten the holding screws.
3. Connect the plug end of the 34-pin V.35 DTE cable to the other end of the V.35 adapter.

   Tighten the holding screws.
4. Connect the other end of the DTE cable to the appropriate port on the computer or DTE.

   Tighten the holding screws.

Refer to Chapter 4 to learn how to reconfigure the DSU's port(s).

Verifying Operation and Testing Connections

Verification testing should be performed after any installation.

After installing and configuring the circuit (including control and tributary DSUs, the DDS network, the DBMs and their dial connections), perform the following series of tests *from the control DSU* to verify network operation (using either the DCP or NMS).

Verifying Network Addresses

Access the DSU's identity (ID) subbranch *for each tributary DSU* to ensure that the DSUs are properly addressed. Refer to Chapter 5 for an example using the DCP, if needed.

▶ Procedure

1. Select **Remot** (Remote branch).
2. Enter the tributary's network address.
3. Select **Stat** (Status branch).
4. Press the ▻ key until ID appears.
5. Select **ID**.
6. Press the ▻ key until *Network Addr* appears.
7. Verify that the correct address has been entered.

Repeat this procedure for each tributary DSU in the network.

Verifying the Network

Perform a Digital Test on the DDS circuit to ensure that the network is functioning.

▶ Procedure

1. Select **Test** (F3).
2. Select **DSU** (F1).
3. Press the ▻ key until DT appears.
4. Select **DT**.
5. Select **Start** (F1).
6. Select a port.
7. Enter the address of the remote DSU.
8. Select the amount of time you want the test to run in hours: minutes: seconds (hh:mm:ss).
   - Press the ◅ or ▻ key to move the blinking cursor to the digit to be changed.
   - Press the F1 (↑) key to increment the digit (1 through 9).
   - Press the F2 (↓) key to decrement the digit.
9. Select **Enter** (F3). *Please wait* appears as the DSU starts the test.
10. When *Command Complete* appears, press the △ key.
11. Select **Displ** (F1) to display the results of the test.

    Table 4-6 in Chapter 4 shows the information received from a Digital Test.
12. Press the ▻ key to scroll through each result.

Verifying DBM Operation

If a DBM is installed, test the tributary DBM for dial tone, and verify that the DSU can place and receive calls.

▶ Procedure

1. Select **Bckup** (F2).
2. Select **Dial** to establish a dialed call to the tributary.

   (Refer to Chapter 4 for the procedure for entering telephone numbers.)
3. Select →**Dial** to switch to the dial circuit.
4. Perform a Digital Test following the DBM path rather than the DSU path.

   (No error message should appear.)
5. Select **DrBU** to drop the backup call.
6. Perform a Digital Test on the DBM. Follow the *Verifying the Network* procedure, selecting DBM instead of DSU (Step 2).

Verifying TDM/Flex Operation

If a TDM/Flex is installed, perform a Digital Test on each port.

Other Tests

The following lists the tests available on your DSU. Refer to the *Test Branch* section of Chapter 4 for further test information, as well as more detail on how to configure and operate the DSU. Refer to Appendix A to determine how best to access each test.

- **Device Test** (Devic)
- **Local Loopback** (LL)
- **DTE Loopback** (DTE)
- **Digital Loopback** (DL)
- **Remote Digital Loopback** (RL)
- **Bilateral Loopback**
- **Digital Test** (DT)
- **End-to-End Test** (EE)
- **Bit Error Rate Test** (BERT)
- **Lamp Test** (Lamp)

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Overview

A Model 3551 DSU is designed for installation in a COMSPHERE 3000 Series Carrier, which supplies power and provides the interfaces for connecting to the DDS or dial networks. Up to 16 DSUs can be installed in the carrier. Refer to the *COMSPHERE 3000 Series Carrier, Installation Manual* for additional carrier and installation information.

The DSU is delivered ready to install in the carrier. It is configured as a control DSU for operation at 9.6 kbps on a multipoint circuit.

A rear connector plate, which is installed onto the rear of the carrier, is shipped with the DSU. The rear connector plate contains two connectors: a 25-pin EIA-232-D/V.24 connector and a 25-pin V.35 connector. Once installed, the DSU can be removed from the front of the carrier without disconnecting the DTE cables.

Installation of the DSUs and carrier-related equipment consists of the following steps, which should be performed in the order listed.

- Hardware straps
- DSU physical installation
- Network diagnostic connection
- Software configuration
- DDS network (or LADs) connection
- Dial (or PSTN) network connection (if a DBM is installed)
- DSU DTE connection
- Verification testing

Before You Begin

The COMSPHERE 3000 Series Carrier should already be installed properly and be operational, with a functioning shared diagnostic control panel (SDCP). An SDCP (installed in the carrier) is required for installation and maintenance of the Model 3551 DSU. For installation information, see the *COMSPHERE 3000 Series Carrier, Installation Manual*.

A fan module may also be needed to dissipate heat. Refer to the *Fan Module Installation* section in Chapter NO TAG of the *COMSPHERE 3000 Series Carrier, Installation Manual* to determine whether a fan is required.

The distance between your DTE and the DSU must be within EIA-232-D/V.24 or V.35 limits.

- *For the EIA-232 connector*, the typical maximum distance is 50 feet at speeds less than or equal to 19.2 kbps. If a longer distance is needed, use high quality, low capacitance cable and ensure that the effective shunt capacitance of the circuit (measured at the DSU and including the capacitance of the cable and the DTE) does not exceed 2500 picofarads, as specified in EIA-232-D.
- *For the V.35 connector*, the recommended maximum distance between a DTE and DSU is nominally 1000 feet.

Before connecting the DSU, you need to contact the telephone company to coordinate your installation before connecting the DSU to their network. The DSU can only be operated at the data rate for which access to the DDS network is provided. If a DBM is installed, the DSU must also be connected to the dial network. You must notify the telephone company before you connect to the dial network. *Refer to the notice at the front of this guide to ensure compliance with FCC, Bell Canada, and Canadian DOC rules*.

How to Change Hardware Straps

HANDLING PRECAUTIONS FOR STATIC-SENSITIVE DEVICES

This product is designed to protect sensitive components from damage due to electrostatic discharge (ESD) during normal operation. When performing installation procedures, however, take proper static control precautions to prevent damage to equipment. If you are not sure of the proper static control precautions, contact your nearest sales or service representative.

The Model 3551 DSU has several hardware straps that control the permissive or programmable connection when a DBM is installed, the Test Mode Indication leads, and the external interface leads (used with a –48 Vdc Central Office Power Unit).

Refer to Figure 3-1 to locate the switch and jumper locations. If a DBM is installed, refer to Table 3-1 to determine which switch needs to be changed, if any. Refer to Table 3-2 to determine whether these jumper straps need to be changed.

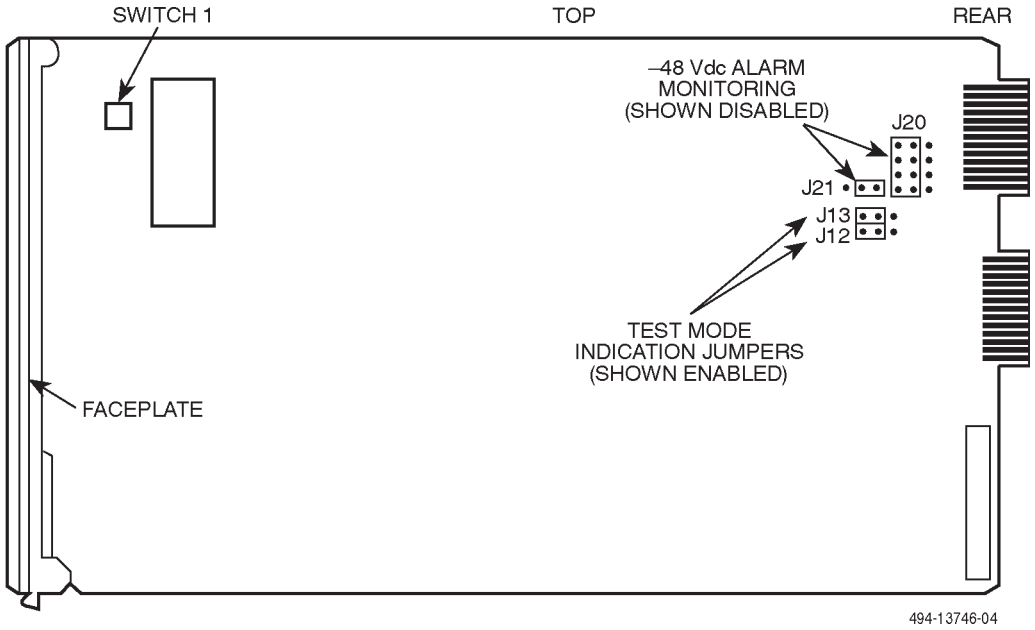


Figure 3-1. Model 3551 DSU Switch and Jumper Locations

Table 3-1
Model 3551 DSU Switch Settings

Switch Position	Switch Setting	Function
S1-1	ON (default)	Permissive V.32 DBM transmit output level of –9 dBm
	Off	Programmable V.32 DBM transmit level between –12 dBm and 0 dBm
S1-2	ON	Frame ground (FG) connected to signal ground (SG)
	Off (default)	FG connected to SG through 100 ohm resistor
ON is to the rear as you face the front of the DSU. Off is to the front.		

Table 3-2
Model 3551 DSU Jumper Straps

Strap Designation	State of Jumper Strap	Function
J12	Left	V.35 Test Mode Indication: **Left** — Enables V.35 Test Mode Indication (Pins 1 and 2). *This is the factory default.* **Right** — Disables V.35 Test Mode Indication (Pins 2 and 3).
J13	Left	EIA-232-D Test Mode Indication: **Left** — Enables EIA-232-D Test Mode Indication (Pins 1 and 2). *This is the factory default.* **Right** — Disables EIA-232-D Test Mode Indication (Pins 2 and 3).
J20	Left	Alarm Monitoring (used with the –48 Vdc Central Office Power Unit): **Left** — Disables the –48 Vdc alarm monitoring function (Pins 1 and 2). *This is the factory default.* **Right** — Enables the –48 Vdc alarm monitoring function (Pins 2 and 3); the NMS adapter cable is being used for alarm monitoring.
J21	Right	Alarm Monitoring (used with the –48 Vdc Central Office Power Unit): **Left** — Enables control of alarm monitoring via the NMS adapter cable (Pins 1 and 2); the NMS adapter cable is being used for alarm monitoring. **Right** — Disables control of alarm monitoring via the NMS adapter cable (Pins 2 and 3); a standard EIA-232 cable or the NMS adapter cable is being used for the diagnostic channel. *This is the factory default.*

Installing the DSU

The initial installation procedure for the Model 3551 DSU requires the installation of a rear connector plate onto the rear of the COMSPHERE 3000 Series Carrier (Figure 3-2). After the initial installation, the DSU can be installed or de-installed by simply removing the DSU from the carrier.

▶ Procedure

1. At the rear of the carrier, set the tab on the rear connector plate into one of the slotted grooves on the carrier's backplane. Loosely fasten the screws. Make sure the rear connector plate uses the same slot position intended for the DSU.
2. Loosely fasten the screw attached to the rear connector plate, allowing for slight adjustment that may be needed when installing the DSU.
3. Change any default hardware strap settings that may be required before installing the DSU.

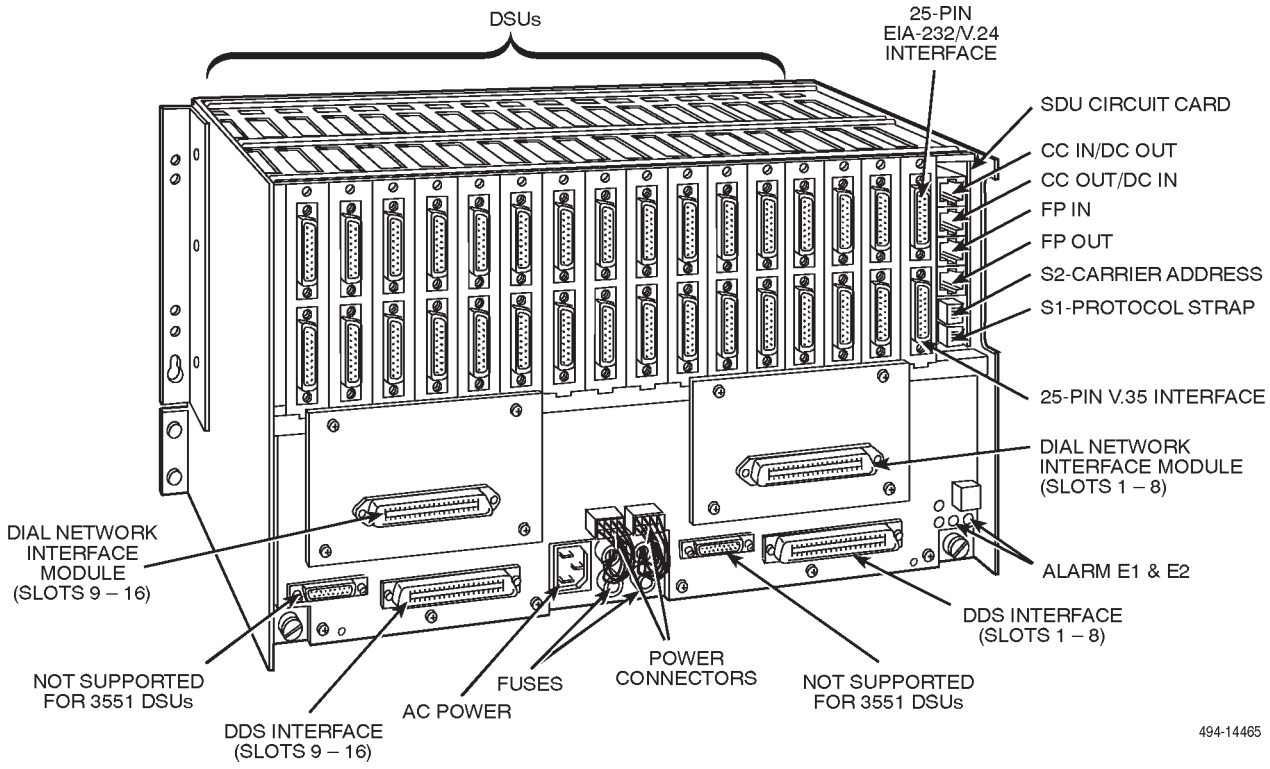


Figure 3-2. COMSPHERE 3000 Series Carrier, Rear View

4. Using a Phillips screwdriver, loosen the screw holding the circuit pack lock and rotate the lock to the open position (Figure 3-3). Open the latch.
5. At the front of the carrier, hold the DSU vertically with the latch on its faceplate in the open position. Then, insert the circuit card into the top and bottom circuit card guides for the slot that contains the rear connector plate.

   Slide the DSU into the slot, aligning the circuit card with the rear connector plate until the connectors seat firmly into the back of the carrier. Press the faceplate latch to secure the DSU into the carrier, rotate the circuit pack lock into the closed position (Figure 3-3), and tighten the screw.
6. Return to the rear of the carrier and tighten the rear connector plate screw.

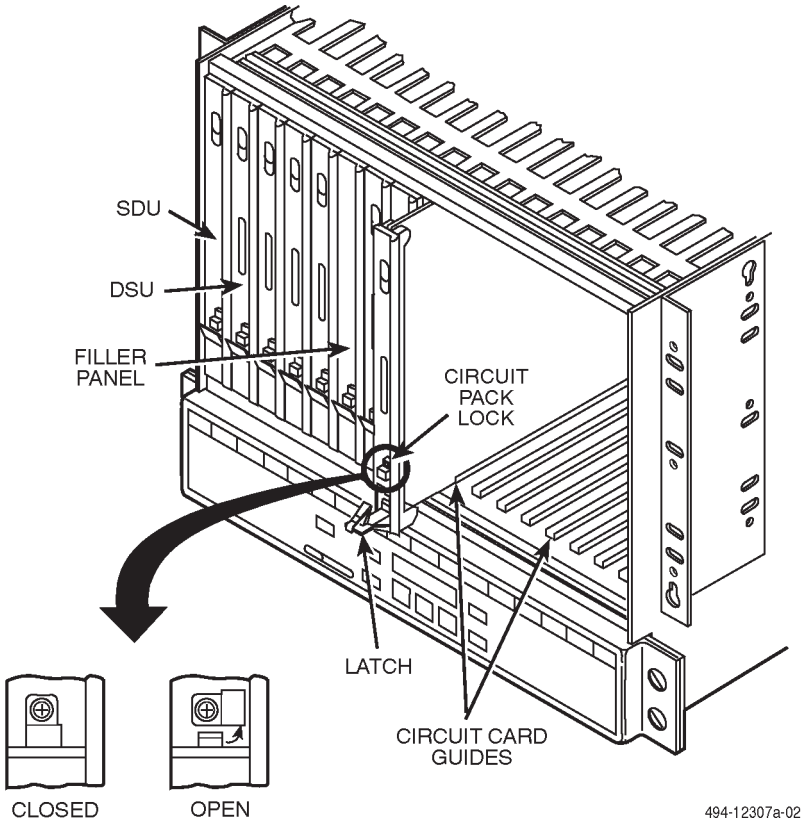


Figure 3-3. Model 3551 DSU Installation and Circuit Pack Lock

7. At the rear of the carrier, connect the appropriate DTE interface cable (EIA-232-D or V.35) to the rear connector plate. For an EIA-232-D interface cable, connect the EIA-232-D cable to the top DTE connector on the rear connector plate.

   For the 25-pin V.35 interface, a V.35 adapter is shipped with the unit. To connect a V.35 adapter to the 25-pin V.35 connector, refer to Figure 3-4 and perform the following steps:

   a. Connect the 25-pin end of the DSU's V.35 adapter to the bottom DTE connector of the rear connector plate. Tighten the screws on each side of the connector.

   b. Connect the 34-pin end of the DSU's V.35 cable to the V.35 adapter, then tighten the screws on each side of this connector.

8. The installed DSU is connected to the DDS network through the 50-pin connectors at the rear of the carrier. These interfaces are specified in the USOC RJ48T, and the pin assignments are shown in Appendix D. Proper network connection to the DDS facility or to the network channel-terminating equipment must be made at the far end of the cable.

9. If the network line and remote DSU are installed and tested, do a Remote Loopback – a Test Pattern test.

10. If the **Front Panel** test switch strap is to be disabled, slide the DSU slightly out of the carrier, open switch S3-1, then reseat the DSU into the carrier. Do this now.

11. Circuit ID information can be written on the cover plate under the appropriate slot number.

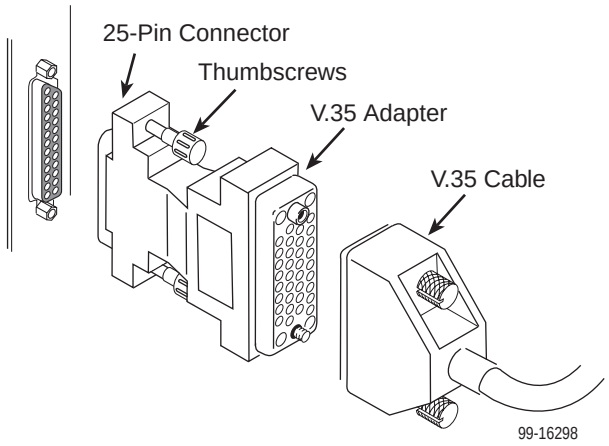


Figure 3-4. V.35 Adapter Installation

Power-Up Routine

When power is applied, the DSU:

- Determines what options (DBM or TDM/Flex) are installed, if any.
- Runs a Device Test on itself and each of the installed options.

  During the tests, all indicators on the DCP light briefly and the message *Power-Up Tests* appears on the liquid crystal display (LCD).
- Displays the results of each test momentarily as **Pass**, **Fail**, or **Abrt**. *(Abrt indicates that the Device Test was aborted because a network loopback was in progress during the power-up procedure*.) These tests take about 20 seconds to complete.

  If a TDM/Flex is installed, MUX is displayed as Pass or Fail.

If the DSU or DBM fails this test, follow the procedure below. Refer to Appendix A as you perform the procedures described in this guide. Refer to Chapters 4 and 5 for additional examples and procedures.

▶ Procedure

1. Press the ⏢ key to return to the top-level menu.
2. Select **Local** (F1 key).
3. Press the ▻ key to scroll the Confg (Configuration) branch into view.
4. Press the function key directly below **Confg**.
5. Press the F1 key to select **Opts** (Configuration Options).

   The *Load from* screen appears.
6. Press the ▻ key to bring the factory-loaded unit configurations into view, and select the appropriate configuration.
   - **PTPC** for a point-to-point control
   - **PTPT** for a point-to-point tributary
   - **MPTC** for a multipoint control
   - **MPTT** for a multipoint tributary
7. Press the F1 key to **SAVE** the selected configuration.

   The *Save to* screen appears.
8. Save the selected configuration to **Activ** (F1 key).
9. Press the ⏢ key to return to the top-level menu, then select **Local** again.
10. Select the **Test** branch (F3).

    The *Run Test on* screen appears.
11. Select the device that Failed: the DSU (or the TDM/Flex) or DBM.
12. Press the F2 key to run the Device Test again.

    The device should pass.
13. Should the device fail, contact your service representative (see Chapter 1).

Connecting to the Network

Network connections are provided through the 3000 Series Carrier. Refer to Figure 3-2 as you read the following sections and set up your network connections.

Connecting to the NMS

A Model 3551 DSU is set up for network diagnostic connection through the shared diagnostic unit (SDU), which is installed in Slot 0 of the carrier. Refer to the *COMSPHERE 3000 Series Carrier, Installation Manual* to set up the network diagnostic connection.

For connection of the DSU, see Appendix E of this guide. For pin assignments, see Appendix D.

Connecting to the Dial (or PSTN) Network

Connection to the dial network (or public switched telephone network – PSTN) for the carrier-mounted Model 3551 DSU is through a network interface module (NIM) that is installed onto the carrier's backplane (see Figure 3-2). Refer to the *COMSPHERE 3000 Series Carrier, Installation Manual* for additional information or to install the NIM.

Connecting to the DDS (or LADS) Network

> **NOTE**
>
> Before connecting the DSU to the DDS network, ensure that approved primary protectors have been installed on the circuit in accordance with Article 800 of the National Electric Code, NFPA 70, in the United States and Section 60 of the Canadian Electric Code, Part 1, in Canada.

If connecting the DSU to a LADS network there are distance limitations that govern the use of DSUs on the network. Table 2-2 in Chapter 2 summarizes these limitations.

The DDS network interface is provided by two RJ48T 50-pin connectors on the back of the carrier (refer back to Figure 3-2, DDS Interface). Each connector serves eight contiguous slots in the carrier: one for Slots 1 through 8 and one for Slots 9 through 16.

Appendix E provides connectivity diagrams should you need further assistance in connecting the DSU to the network.

Connecting the DSU to a DTE

The DTE interface for the Model 3551 DSU is provided through its rear connector plate. Each rear connector plate contains two DB25 (or 25-pin D-type) connectors. The top connector is an EIA-232-D/V.24 (ISO 2110) connector. The bottom connector is a ITU-T V.35 (ISO 2593) connector.

To use the 25-pin V.35 connector (used for speeds greater than 19.2 kbps), a V.35 adapter is needed (feature number 3000-F1-510). This adapter provides the interface between the 25-pin V.35 D-type connector and a V.35 DTE cable.

Each DSU can be configured to use either interface (EIA-232 or V.35) independent of other DSUs in the carrier. Connection of the DSU to the DTE is a matter of selecting and installing the appropriate cable. Refer to the *COMSPHERE 3000 Series Carrier, Installation Manual* for installation procedures.

Appendix E provides connectivity diagrams should you need further assistance in connecting the DSU to the network.

Addressing the Unit

A unique address must be assigned to each control and tributary DSU in your network. You can assign an address within the range of 1 through 255.

> **NOTE**
>
> Do **not** assign the number **192** as a network address. This number is reserved as a broadcast address.

If a DBM is installed, it requires a separate address which is automatically assigned by the DSU. The address assigned a DBM is the DSU's address, plus 1 (e.g., if the DSU's address is 1, the assigned DBM address will be 2).

> **NOTE**
>
> The numbers **191** and **255** cannot be assigned to a DSU that has a DBM. However, addresses can be assigned in any order; they do not have to be sequential.
>
> It is recommended that only *odd-numbered addresses* be assigned to DSUs so that *even-numbered addresses* are reserved for DBMs. If your network does not currently include DBMs, you retain the flexibility to add them later without having to reconfigure your entire network.

Tributary DSU Addressing

Tributary DSU addresses are user-definable, but take care to ensure that their addresses are unique on a multipoint circuit. *If two tributaries are assigned the same address, you will not be able to communicate with either one*.

The control DSU accesses its tributary by specifying the tributary's address.

The 6700 Series NMS accesses the DSU via its network address. *To access a tributary DSU*, the NMS first addresses the control, then the tributary. An address issued from the NMS takes the format of control channel/control network address/tributary network address. This is called *link-level network addressing*.

Figure 3-5 shows an example of DSU and DBM addressing, as well as link-level network addressing.

Refer to Chapter 4 to learn how to set the DSU's network address.

Verifying Operation and Testing Connections

Verification testing should be performed after any installation.

After installing and configuring the circuit (including control and tributary DSUs, the DDS network, the DBMs and their dial connections), perform a series of tests *from the control DSU* to verify network operation (using either the SDCP or NMS).

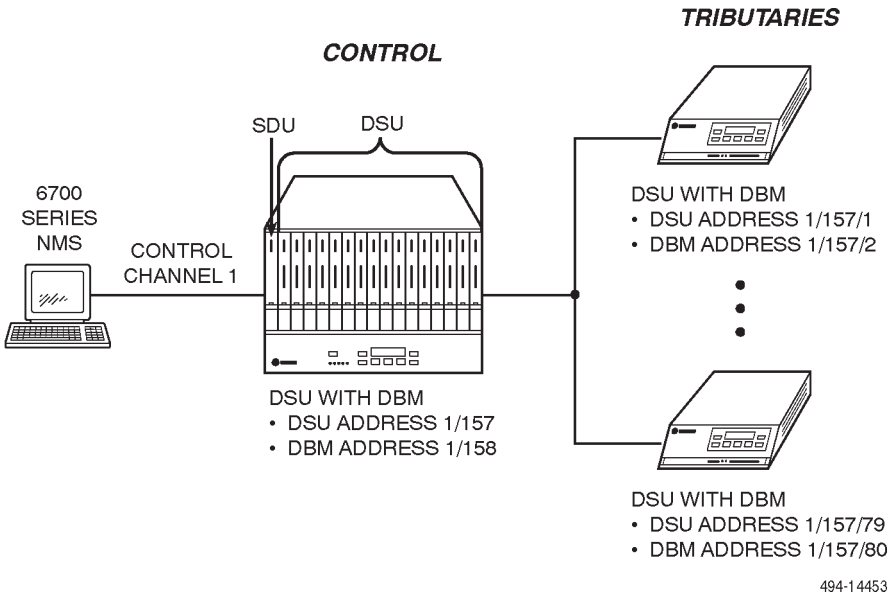


Figure 3-5. Addressing Example

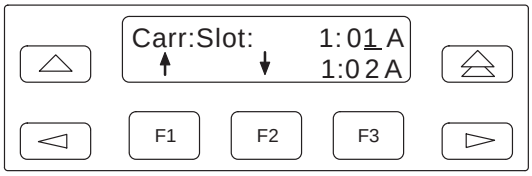
To Connect the SDCP to a DSU

For the carrier-mounted Model 3551 DSU, the SDCP must first be reconnected to the DSU. Once connected, the SDCP operates like a DCP.

▶ Procedure

1. Press the **Select** key (refer to Figure NO TAG-2).

   A screen similar to the following appears.



   The cursor is usually positioned under the second position of the slot number (1:01).

   In this example, the *first line* shows

   1 indicates Carrier 1 (Carr)

   01 indicates the DSU in Slot 1

   A is reserved for future use

   On the *second line*

   Press the **F1** key (↑) to increment the number that the cursor is on.

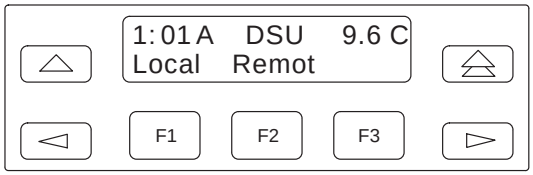
   Press the **F2** key (↓) to decrement the number.

   Press the ◁ and ▷ keys to move the cursor one position to the left or right, to change either the carrier or slot number.

   Press the **F3** key to toggle between DSUs, to switch from 1:01A to 1:02A in this example. (In our example, the previously accessed DSU was located in Slot 2 of Carrier 1.)

2. Press the **Select** key on the SDCP again.

   The SDCP accesses the DSU in Carrier 1, Slot 1. The top-level menu (your starting point) of the carrier-mounted DSU is displayed.



   From the *first line* of this example, you can see that this is a carrier-mounted DSU (1:01A instead of Port1) that is located in Carrier 1, Slot 1, is operating as a DSU (i.e., not as a DBM), at 9.6 kbps, and is configured as a control (C).

   From the second line you can see that there are no NMS messages (no *Msg* branch over the F3 key) waiting to be read and cleared.

   Also note that the SDCP indicator on the selected DSU's faceplate, **Front Panel**, is lit.

Verifying Network Addresses, the Network, and DBM Operation

Access the DSU's identity (ID) subbranch *for each tributary DSU* to ensure that the DSUs are properly addressed.

Perform a Digital Test on the DDS circuit to ensure that the network is functioning.

If a DBM is installed, perform the Digital Test by selecting DBM from the *Run Test from* screen instead of DSU. Next, test the tributary DBM for dial tone, and verify that the DSU can place and receive calls.

Refer to the *Verifying Operation and Testing Connections* section of Chapter 2 for procedures that lead you through each of these procedures.

Other Tests

The following lists the tests available on your DSU. Refer to the *Test Branch* section of Chapter 4 for further test information, as well as more detail on how to configure and operate the DSU. Refer to Appendix A to determine how best to access each test.

- **Device Test** (Devic)
- **Local Loopback** (LL)
- **DTE Loopback** (DTE)
- **Digital Loopback** (DL)
- **Remote Digital Loopback** (RL)
- **Bilateral Loopback**
- **Digital Test** (DT)
- **End-to-End Test** (EE)
- **Bit Error Rate Test** (BERT)
- **Lamp Test** (Lamp)

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Overview

A 3550 Series DSU can be managed from its control panel or from the COMSPHERE® 6700 Series NMS. This chapter describes how to manage the DSU using the control panel. Refer to the *COMSPHERE 6700 Series Data Network Management System, User's Guide* to understand how to manage the unit from the NMS.

The DSU's menus are organized as a branching hierarchy, sometimes referred to as a **menu tree**. Refer to Appendix A as you perform the procedures described in this guide to help you quickly learn more about your DSU.

DCP and SDCP Operation

There are two types of control panels, one for each DSU model. The standalone Model 3550 DSU (Figure 4-1), is controlled from its diagnostic control panel (DCP); the carrier-mounted (nest- or rack-mounted) Model 3551 DSU (Figure 4-2) is controlled from a shared diagnostic control panel (SDCP). The SDCP is mounted onto the COMSPHERE® 3000 Series Carrier to control multiple units.

NOTE

Throughout this guide, **DCP** refers to either control panel, *DCP* or *SDCP*, except where a distinction is made.

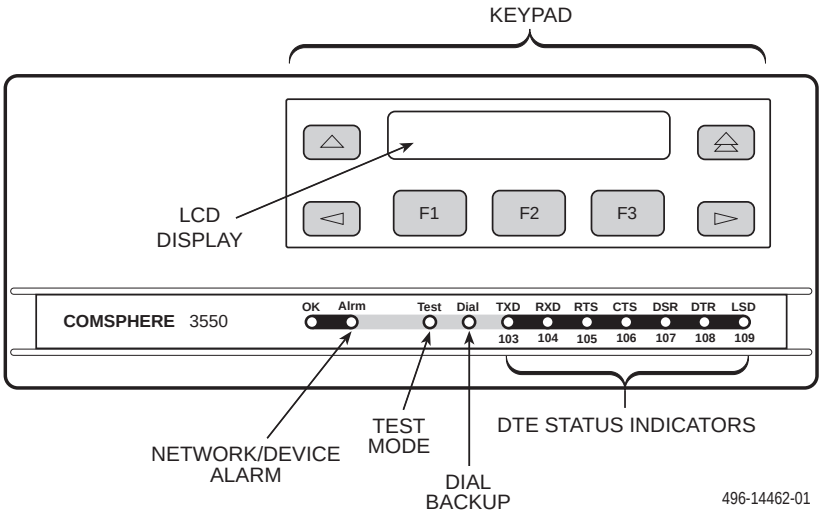


Figure 4-1. Model 3550 Diagnostic Control Panel

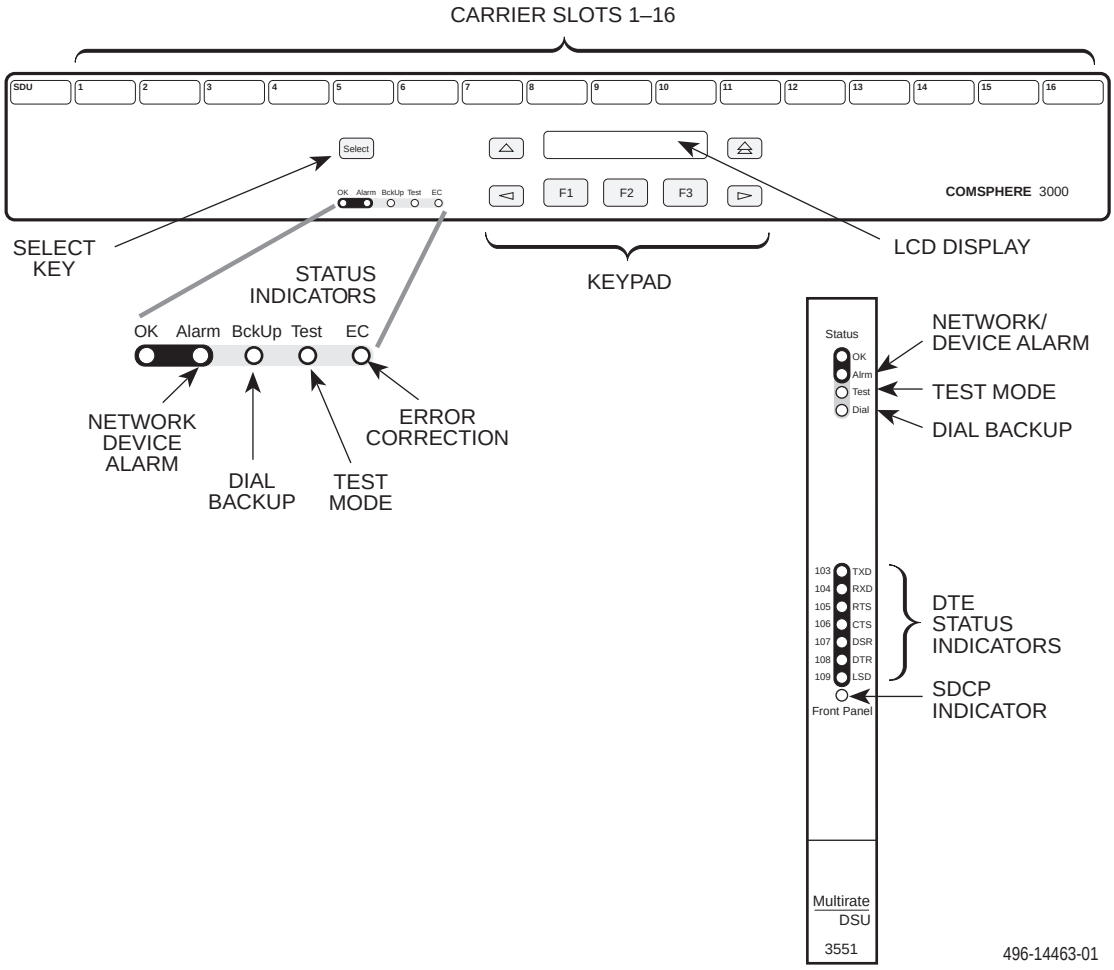


Figure 4-2. SDCP and Model 3551 DSU Faceplate

Both control panels have a 2-line, 16-character liquid crystal display (LCD) and a keypad, through which you can

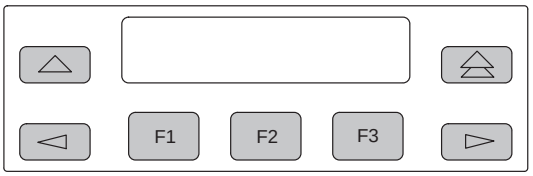
- Monitor the unit's health and status
- Initiate dial backup
- Initiate diagnostic tests
- Load or change the unit's configuration, or how it will operate
- Enable or disable the DSU's, DBM's, or port's transmitter
- Display or change the status of the general purpose external DTE leads.

The DCP's LCD displays the result of any command initiated from the DCP.

Refer to Appendix C to understand the meaning of DCP status indicators.

Keypad

There are seven keys on the DCP of the standalone Model 3550, and eight on the SDCP for the carrier-mounted Model 3551 DSU. The additional key, the **Selec**t key, connects the SDCP to a specific DSU located in a specific carrier and slot within the carrier.



- The ⏢ key returns you to the top-level menu, and terminates any work in progress.
- The △ key returns you to the previous display, one level up from the current display. It can also be used to terminate a data entry display without making a change.
- The ◁ and ▷ keys scroll menus or other displays to the left or right, respectively.

  On status and test result displays, the ◁ and ▷ keys scroll additional information into view.

  On data entry displays, these keys move the cursor one character to the left or right to allow entry of one digit or character at a time.
- Function keys (**F1**, **F2**, or **F3**) select the item displayed directly above the key.

Additional information on operating the DSU's keypad can be found in the procedures used to install and verify operation of the DSU in Chapters 2 and 3, the procedure for editing configuration options in Chapter 5, and the various procedures scattered throughout this chapter.

Menu Structure

The menu is your map through the DSU's various functions. The following sections describe each branch and subbranch, and provide procedures for operating certain features. Appendix A shows the complete menu and describes the DSU's branches and subbranches.

Top-Level Menu

The top-level menu is the *starting point* for all DSU operations. You can always return to this point from anywhere in the menu by pressing the ⏢ key. Pressing this key immediately terminates any operation or work in progress. Refer to Appendix A as you read about the branches and subbranches.

Status Branch

The Status (**Stat**) branch reports on the health and status of the DSU, DBM, TDM/Flex, the DTE interface, the quality of the dial connection, the identity of the DSU (model number, serial number, etc.), and the terminal's power (where it checks the presence of voltage on the DTE's RTS lead).

Health and Status

The Health and Status (**H/S**) subbranch displays the health and status of the DSU, as well as a DBM or TDM/Flex, if installed. It automatically scans for DSU and line conditions that are not within normal limits.

There are three types of Health and Status messages:

- **Devic** (Device Health and Status)
- **Expan** (Expanded Health and Status)
- **Subn** (Subnetwork Health and Status)

All alarm and status conditions are displayed for the specified DSU at the time the option is selected. *For a local DSU*, the alarm and status conditions are updated every 2 seconds; *for a remote DSU*, the alarm and status conditions are not updated.

Refer to Appendix C for a complete listing of these messages.

Device Health and Status

Device Health and Status (**Devic**) reports health and status information for a selected DSU. *If five minutes elapse without a key being pressed*, the Device Health and Status screen is redisplayed.

- When the digital circuit is the active link,
  - — The *first line* displays a running normal-operation timer (hh:mm:ss).
  - — The *second line* displays the DSU's operating rate and can also display one or more of the test or alarm messages.
- An asterisk (*) appears at the far right to indicate NMS activity.
- A right arrow (→) appears just before the asterisk if there is more than one message. Press the ▷ key to see the next message.

Expanded Health and Status

Expanded Health and Status (**Expan**) only appears during automatic dialing. It retrieves Health and Status information for the local DSU after an automatic backup attempt has failed, or when there is a disconnect after a successful connection.

If the right arrow (→) appears to the right of *Expanded H/S*, there is more than one message. Press the ▻ key to see the next message.

Subnetwork Health and Status

Subnetwork Health and Status (**Subn**) displays status information from a DSU's subnetwork (all DSUs and DBMs assigned to that DSU's active poll list). The downstream network addresses and current statuses are listed. To page through tributary addresses:

- Press the **F1** key (↑) for the *next highest* network address.
- Press the **F2** key (↓) for the *next lowest* network address.

DTE Status

The **DTE** status subbranch provides a snapshot status of the local or remote unit's external DTE interface.

- *For the local DSU status*, the display is sampled and updated every 2 seconds.
- *For the remote DSU status*, only one set of states is returned based upon a monitoring period of approximately 3 seconds.

The DTE interface statuses are displayed in sets. Use the ◅ or ▻ key to scroll each set of lead statuses into view.

Circuit Quality

Circuit Quality (**CircQ**) shows the level and quality of the signal being received from the network by the DBM. *This subbranch is only available for a V.32 DBM.*

Identity

Identity (**ID**) displays a listing of the DSU's model and serial numbers, the equipment installed (DBM or TDM/Flex), software/firmware versions, the network address, the DDS or DSU's rate, the DBM's rate, and whether the TDM/Flex is currently activated.

▶ Procedure

1. Press the ▻ key to scroll *ID* into view.
2. Press the function key (**F1**, **F2**, or **F3**) directly below the selection. *One field at a time is displayed.*
3. Press the ▻ key to display the information, one display (screen) at a time.

Table 4-1 lists the Identity information provided about the DSU and its equipment.

Terminal Power

Terminal Power (**TPwr**) displays the status of the connected DTE's EIA-232 and V.35 interface (connector). The DSU checks the state of the *RTS lead* to determine when the DTE is ON.

- When the voltage is less than –3V or greater than +3V for both the EIA-232 and V.35 interfaces,
  - — The *second line* displays **On** if power is detected.
  - — The *second line* displays **Off** if no power is detected.

Table 4-1
Identity Descriptions

Description	Information Displayed
Model:	3550 or 3551.
S#:	Unit serial number.
DSU SW ver:	Software/firmware version residing on DSU.
Netwrk Addr:	Unit's network address.
DSU Rate:	Value set for DSU *Rate(Kbps)* configuration option.
DBM Rate:	Value set for DBM *Rate(Kbps)* configuration option; the DBM's aggregate speed. It only appears when a V.32 DBM is installed.
MUX Card:	2Prt – Type of TDM/Flex installed. It only appears when a TDM/Flex is installed.
MUX App:	TDM or None – Currently configured application (refer to the *MUX (Setup)* option set). It only appears when a TDM/Flex is installed.
MUX SW ver:	Software/firmware version residing on TDM/Flex. It only appears when a TDM/Flex is installed.

Backup Branch

The Backup (**Bckup**) branch controls dial backup operation. This branch appears when a DBM is installed, or when the DSU is configured to support an *external* dial backup unit (DBU). The following sections explain dial backup operation.

Dial Backup Operation

The Model 3550 or 3551 DSU with dial backup capability can provide backup for a point-to-point circuit operating at 14.4 kbps or below. Appendix E shows some typical dial backup system configurations.

Backup is controlled primarily by software configuration options in the *DBM* or *ExtBU*, and *Backup* option sets. The unit can be configured so that backup can be either automatic or manual. Backup can be controlled from either the DSU's control panel or a 6700 Series NMS.

Backup begins with configuring the unit.

Configuring the Unit for Dial Backup

The following configuration options should be set, whether initiating backup manually or automatically.

DBM Option Set:

- **AutoAnswer** – Select ***Enab***.

  When enabled, this option set allows the DBM to answer an incoming call. (Enab is the factory-loaded default setting.)

- **Call Setup** – Set call setup security level:

  None – No call setup security is required. (None is the default.)

  Password – Originating and receiving DBMs exchange passwords before the DBMs can enter Standby mode. There must be an incoming password (RxPwd) and an outgoing password (TxPwd) set up.

  Callback – Both DBMs must exchange passwords and a Backup Directory pointer must be sent before a call can be initiated. There must be an incoming password (RxPwd) and an outgoing password (TxPwd) set up, and the originator's local telephone number (Phone subbranch) must be stored in the answering DBM's Backup Directory.

  Alarm – No security is to be used at the control DBM, and the DBM only answers incoming calls when there is a facility alarm.

If the control DSU is to initiate the call, set the control for Pswrd and the tributary for Cllbk.

If the tributary DSU is to initiate the call, set the control for Cllbk and the tributary for Pswrd.

External DBU Option Set (This option set will not appear if a DBM is installed.):

- **ExtBU** – Select whether the *external* DBU will answer or place backup calls. The *external* DBU must be able to support Dial on DTR.

  Ansr – The *external* DBU will answer incoming calls. The DBU must provide DSR when the call is complete.

  Orig – The *external* DBU will place an outgoing call.

  None – The external backup feature is disabled. The DSU will not switch data to the alternate port. (None is the default.)

Backup Option Set (None of these need to be set for manual backup.):

- **Auto Bckup** – Select ***Enab***.

  When enabled, the DSU will automatically initiate dial backup. Up to 10 attempts will be made.

  If both the control and tributary DSUs are configured for automatic backup, *NtwkTimOut* should be set to *different* values so that the control and tributary DSUs do not try to place a call at the same time.

  On a point-to-point circuit, it is best that only one end performs automatic backup. It is possible to trigger the backup for single-direction network failures only detected at the remote DSU. The remote DSU must have *RTS Control* set to FrcOn.

- **Bckup Dir** – Select the call directory identifier (1 to 10) stored in the DBM's Backup Directory for the telephone number to be dialed.

- **AutoRestor** – Select ***Enab***.

  When enabled, the DBM or *external* DBU automatically restores data to the DDS circuit when service is restored and the amount of time set in *RestoreTimOut* has expired.

- **NtwkTimOut** – Set the amount of time that the DDS circuit must be out of service before a backup attempt is made: from 0:00 (minutes:seconds) to 29:59 (the default is 0:20).

- **RestorTimOut** – Set the amount of time that the DDS circuit must be back in service before automatic restoration is attempted: from 1 to 60 minutes (the default is 5 minutes).

- **TriesTimeOut** – Specify the overall time limit during which a DBM will automatically attempt to establish a dial backup call: from 1 to 60 minutes (the default is 15 minutes). *Auto Bckup* must be enabled.

- **MultiCall** – Select ***Enab***.

  When enabled, instead of following the normal calling cycle, the DBM cycles through all dial strings contained in its Backup Directory until a call attempt is successful.

  Do not enable MultiCall unless more than one telephone number is in the Backup Directory and each successive (i.e., 1, 2, 3, etc.) telephone number is different from the previous entry. Directory entries should be unique.

Understanding Operating Modes

When a DSU is equipped with a DBM or an *external* DBU, the Backup branch controls operation of the Dial Backup function. The DBM has four modes of operation:

- In **Idle mode**, there is no dialed connection. The DDS circuit is active and carrying user data and diagnostics.

- In **Standby mode**, the unit has a dialed connection to another DBM or compatible dial backup unit, but the DDS circuit is still active and carrying user data. The dialed digital circuit carries diagnostic traffic addressed to either the tributary DSU or DBM. These diagnostics do not disrupt the DDS circuit.

- In **Dial Backup mode**, the dialed circuit is active and carrying user data and diagnostics.

- In **External Backup mode**, the *external* DBU is the DSU's alternate connection with the remote device. Depending upon how the DSU is configured, the *external* DBU will either establish the dialed connection (*ExtBU* set to Orig) or respond to an incoming call (*ExtBU* set to Ansr). Once the dialed connection is established, the DSU switches data and diagnostics to the dialed link, then drops backup when service is restored.

Table 4-2 lists the Backup branch operating modes and explains the effects of each backup command.

Table 4-2
Backup Branch Menu Selections

Current Backup Mode	Backup Command	Effect
Idle	Bkup	Dial out, establish, and switch to dialed link (Dial Backup mode).
	Dial	Dial out and establish dialed link (Standby mode). (Data is routed over the DDS circuit.)
Standby	Disc	Disconnect dialed link (Idle mode).
	→Dial	Switch data to dialed link (Dial Backup mode).
Dial Backup	DrBU	Disconnect dialed link and switch to private line (Idle mode).
	→DDS	Switch data to DDS (Standby mode).
External Backup	ExtBU	If *ExtBU* in the ExtBU option set is set to Orig, this command is displayed (Idle mode). Select this command to establish a backup call. When the backup call is established, the DSU switches data to the dialed link.
	DrBU	Disconnect dialed link and switch to private line (Dial Backup mode).

Manual Backup

You can control each step of a backup attempt by following one of these procedures.

Placing a Backup Call

To place a backup call:

▶ Procedure

1. Go to the *Bkup* option set under the Confg branch and set *Auto Bckup* to Disab.
2. Select **Bckup** (Backup branch) to select a telephone number from the Backup Directory.

   If the telephone number in the Backup Directory is the number you want to dial, go to Step 5.
3. Select **Dial**, the *Backup Dir* screen is displayed identifying the Backup Directory indicator.
4. Select another telephone number to call:
   - Press the F1 key (↑) to increment the directory indicator (e.g., 1 to 2).
   - Press the F2 key (↓) to decrement the indicator (e.g., 2 to 1).
5. Select **Dial** (F2); the DBM places the call.
6. Once the dialed call has been established, select **→Dial** to switch data to the dial path.

Manual DDS Restoration

Data can be switched back to the DDS circuit once DDS service has been restored.

▶ Procedure

1. From the Bckup branch, select **→DDS** to restore data traffic to the DDS circuit.
2. If the DDS circuit operates normally after the switch, select **DrBU** to drop the backup circuit.
3. If the DDS circuit fails to perform reliably, select **→Dial** again to quickly route data back over the dialed connection.

Manual Dial Backup Termination

- If in *Standby* mode, select **Disc**.
- If in *Dial Backup* mode, select **DrBU**.
- If in *External Backup* mode, select **DrBU**.

Test Branch

The **Test** branch provides extensive testing capabilities for the DSU, the DDS circuit, the DBM (if installed), and the backup circuit. When the tributary DSU receives a test request from the control DSU, it aborts any locally initiated test in progress.

Running a test can affect your application data or may cause your application session to be dropped depending upon front-end processor, time-out parameters, etc. since no data or acknowledgment messages will be transmitted while the test is in progress.

Abort

The **Abort** selection allows you to abort a test that is running. *The DSU cannot run any other test until the test in progress is aborted.*

There are two types of selections to abort a test:

- **Selective** terminates whatever test is in progress at the local DSU.
- **Subn** (Subnetwork) only displays at the control DSU. This selection terminates any test running at the control DSU or at a tributary DSU or DBM associated with the control.

After selecting either Selective or Subn, the test is terminated and the DCP displays the message *Command Complete*.

Device Test

The Device (**Devic**) Test uses a test pattern generator built into the DSU. *If a DBM is installed, the DBM must be in Idle mode, with no call in progress if you want to run a Device Test.*

NOTE

On power-up, the DSU sends out polls to determine whether a DBM is installed. It then initiates a Device Test on itself and the DBM. The results of the tests appear momentarily on the DCP's LCD.

Loopback

The Loopback (**Lpbk**) branch displays four loopbacks:

- Local Loopback (LL)
- DTE Loopback (DTE)
- Digital Loopback (DL)
- Remote Digital Loopback (RL)

Figure 4-3 shows where each loopback occurs on the circuit. Refer to the figure as you read about loopbacks.

Local Loopback

Local Loopback (**LL**) is session-disruptive; that is, performing the test will disrupt data. It permits the DTE to run a test to determine whether the DTE connection to the DSU and the DSU itself are functioning properly. The DSU must be connected to the DTE, but the network connection to the DSU is not required. *This test cannot be performed by the DBM.*

While the DSU is in Local Loopback, any data transmission by the DTE is returned as received data. An operator can send a test pattern and verify correct reception of the test. The DSU does not monitor this testing.

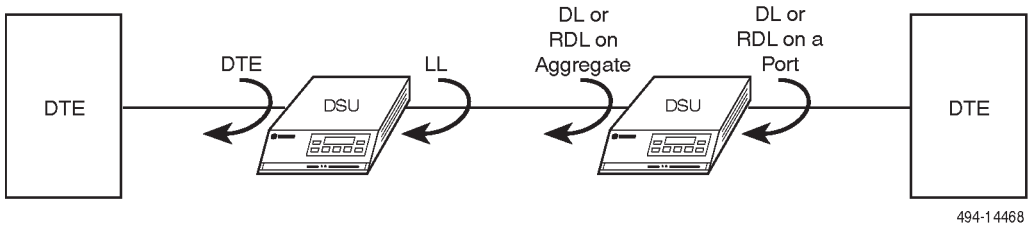


Figure 4-3. Loopbacks

NOTE

To issue a Local Loopback to a *tributary DSU*, the DSU must have a DBM installed or a *Conflict w/ Environ* message will appear. The DBM is required to call the tributary and abort the Local Loopback.

If the NMS is to abort the loopback, the tributary's DBM must be in Idle or Standby mode. If in Dial Backup mode and the NMS issues the *Abort* command, the command will not be recognized. The loopback will have to be aborted from the DSU's control panel.

DTE Loopback

DTE Loopback (**DTE**) loops back the data path at the DTE interface on a per-port basis without affecting the operation of the remaining ports. This loopback is used to verify that the DTE connection and the cable are good.

Digital Loopback

Digital Loopback (**DL**) allows manual testing of the remote end of the circuit. Data coming in is immediately transmitted back. For example, a Digital Loopback may be required in order to complete an external bit error rate test (BERT) from the remote DSU. The local DSU receives test data, loops it back to the transmitter before the DTE interface, and returns it to the network.

Digital Loopback can also be initiated by receiving a V.54 pattern to go into Digital Loopback. Enable configuration options *V.54 Lpbk* (V.54 Loopback) and *RespondRDL* (Respond to Remote Digital Loopback).

Remote Digital Loopback

Remote Digital Loopback (**RL**), sometimes referred to as RDL, typically supports testing using an external device, like a protocol analyzer that is connected to the local DSU's DTE interface. A test message from the external device is looped back from the receiver to the transmitter in the remote DSU and returned to the local DSU.

In Remote Digital Loopback, the local DSU (control or tributary) puts the remote DSU into Digital Loopback. A control DSU can originate Remote Digital Loopback in a point-to-point or multipoint network, whereas a tributary DSU can originate Remote Digital Loopback in a point-to-point network only.

When a DSU (control or tributary) originates Remote Digital Loopback, both the originating DSU and the targeted DSU enter Test mode. No other test can be run at the originating DSU or the targeted DSU until the Remote Digital Loopback is aborted.

The DSU does not generate test results.

Bilateral Loopback

Bilateral Loopback (Bilat Lpbk) is a combination of DTE and Digital Loopbacks operating simultaneously in the same DSU. Both Bilateral and Digital Loopbacks are selected from the General (Gen) option set.

NOTE

If *Bilat Lpbk* is enabled, requesting a Remote Digital Loopback or Digital Test will automatically initiate a DTE Loopback, as well.

Digital Test

The Digital Test (**DT**) checks the functionality of a pair of DSUs and the data circuit between them. This test can also be run on a DBM over a backup connection to a remote DBM for point-to-point testing.

The remote DSU is placed in Digital Loopback, then the local DSU transmits the 511-bit test pattern over the network to the remote DSU for an operator-specified length of time. *In a multipoint network* (where only a control DSU can originate a Digital Test), tributary DSUs not involved in the test are placed in Test mode for the duration of the test.

During the test, the TXD, RXD, and RTS LED indicators show the states of the leads at the DTE interface. At the conclusion of the test, the local DSU releases the remote DSU from Digital Loopback.

To review the results of the test, select **Displ** (Display) and press the ▻ key to scroll through the results shown in Table 4-3.

When the test is over, the top line displays *Final* instead of *Active*.

Table 4-3
Digital Test Results

Results	Information Displayed
Time:	Running test timer. (The Clr selection resets the timer to 0:00:00.)
Tot Error:	Running count of bits in error; Max, if the maximum error count has been reached, the maximum being 64000. (The Clr selection resets the counter to 0.)
Err Secs:	Running count of errored seconds. (The Clr selection resets the counter to 0.)
Run on:port *nn*	If this test was not run on an aggregate data path, the Digital Test was run on port *nn*.

End-to-End Test

The End-to-End (**EE**) Test is used to analyze a control and a tributary DSU or DBM, and the network circuit between them *in both directions independently.* It transmits fixed packets (or blocks) of data between DSUs or DBMs When an End-to-End Test is run, diagnostic data may be disrupted.

To view the results of the test, select **Displ** (Display) and press the ▻ key to scroll through the results shown in Table 4-4.

When the test is over, the top line displays *Final* instead of *Active*.

Bit Error Rate Test

The Bit Error Rate Test (**BERT**) is a session-disruptive test that transmits a 511-bit pattern. It analyzes the network circuit. It can monitor the results by putting the remote DSU or DBM into Digital Loopback and checking the returned pattern for errors, or by simultaneously executing a BERT in the local DSU.

The test continues until aborted from the DCP or NMS. This test can be run on a per-port basis if a TDM/Flex is installed. *A control DSU* can initiate a Bit Error Rate Test in a point-to-point or a multipoint network. *A tributary DSU* can only initiate this test in a point-to-point network.

If nondisruptive diagnostics are in effect (if *Diag Type* is set to NonD), diagnostic data can be disrupted.

To display the results of the test, press F2 to select **Displ**. The results are shown in Table 4-5. *To clear the results* of the test and clear the counters to zero, press F3 to select **Clr**.

Table 4-4
End-to-End Test Results

Results	Reported By[1]	Information Displayed
Time:	Local and Remote DSU/DBM	Running test timer. (The Clr selection resets the timer to 0:00:00.)
Tot Block:	Local and remote DSU/DBM	Number of blocks completed. (The Clr selection resets the counter to 0.)
Rx Blk err:	Local and remote DSU/DBM	Number of incoming blocks with errors detected, indicating a fault in the incoming transmission path. (The Clr selection resets the counter to 0.)
Tx Blk err:	Local and remote DSU/DBM	Number of blocks with errors detected at the remote DSU, indicating a fault in the outgoing transmission path. (The Clr selection resets the counter to 0.)
Rx TimOuts:	Local DSU/DBM only	Number of blocks that were not received or acknowledged by the remote DSU or DBM. (The Clr selection resets the counter to 0.)
[1] *Local* refers to the test initiator.		

Table 4-5
Bit Error Rate Test Results

Results	Information Displayed
Time:	Running test timer. (The Clr selection resets the timer to 0:00:00.)
Tot Error:	Running count of bits in error; Max, if the maximum error count has been reached, which is 64000. (The Clr selection resets the counter to 0.)
Err Secs:	Running count of errored seconds. Errored second is at least one error is detected during a 1-second time period. (The Clr selection resets the counter to 0.)
Run on:port *nn*	Port selected for testing.

Lamp Test

The **Lamp** Test is a test of the status indicators (LEDs) and liquid crystal display (LCD) on the DSU's control panel (both models). Any indicator that does not flash is not functional.

Note that if all LEDs are functioning, all the indicators on the Model 3550 DCP are flashing steadily. In a COMSPHERE 3000 Series Carrier, the indicators on the SDCP remain ON. The LCD on the DCP or SDCP alternately flashes solid blocks, moving from position to position on the display until the test is aborted.

Pressing any key ***except*** the ⏢ key will stop the LCD portion of the Lamp Test and return you to the DSU Test menu so you can abort the test. Once aborted, the LCD and LEDs stop flashing.

Configuration Branch

The Configuration (**Confg**) branch allows you to configure or customize the DSU and its equipment (DBM or TDM/Flex) to fit your site's requirements, to enter and change telephone numbers (if a DBM is installed), and to specify the mode for viewing or editing configuration options.

The 3550 Series DSUs have two special features that simplify configuration of your DSU: Menu mode and the preset (factory-set) unit configurations to fit typical DSU applications.

It is recommended that you set the Menu mode before you select an application configuration, or access option sets.

Selecting Menu Mode

By selecting **Menu** from the Configuration Options (Opts) branch, you can

- View and configure options in each option set, or
- View and edit only those options that are more likely to change.

This feature saves time and simplifies customization of your DSU's configuration. Appendix B, *Configuration Worksheets*, summarizes the unit's configuration options for each Menu mode selection.

▶ Procedure

1. Select **Local** (F1) for the local DSU.
2. Press the ⏵ key until Confg (Configuration branch) is displayed.
3. Select the function key directly below **Opts** (F3).
4. Press the ⏴ key to display *Menu*.
5. Select **Menu** (F1). *Full Mode* appears on the first line of the LCD.

6. Select the mode:
   - Enable Full Mode (F2) – All configuration options will be displayed.
   - Disable Full Mode (F3) – Only those configuration options likely to change will be displayed.

   When the selection is made, it is displayed on the first line of the LCD (e.g., Full Mode: Disab).
7. Select **Save** (F1).
8. Press the △ key to return to the *Configure* submenu.
9. Select **Opts** (F2) and view the difference in the configuration options displayed based upon the current *Menu* mode.

Selecting an Application Configuration

The DSU is shipped from the factory with four common applications already configured. All you have to do is select the appropriate application and load the preset configuration into the unit. These configurations include:

- **PTPC** – Point-to-point control DSU.
- **PTPT** – Point-to-point tributary DSU.
- **MPTC** – Multipoint control DSU.
- **MPTT** – Multipoint tributary DSU.

Select the appropriate configuration based upon how the unit will be used within your network. (Examples of typical point-to-point and multipoint configurations are shown in Appendix E. Refer to the DSU's menu in Appendix A as you follow these steps.

▶ Procedure

1. Select **Confg** (Configuration branch).
2. Press the F1 key to select **Opts** (Configuration Options subbranch).

   The *Load from* screen appears.
3. Press the ◁ or ▷ key to scroll the desired configuration into view.

NOTE

By referencing the menu in Appendix A, you will see that pressing the ◁ key is more efficient if the unit is to operate on a multipoint circuit.

4. Make your selection: PTPC, PTPT, MPTC, or MPTT, and press the function key (F1, F2, or F3) directly below the desired configuration.

   The *Edit/Save* screen appears.

To view the point-to-point or multipoint configuration loaded:

▶ Procedure

1. Select an **option set** (e.g., DSU – F2 key).
2. Press the F1 key (**Next**) to scroll through each configuration option's default (factory-loaded) setting.

NOTE

If *Full Mode* (**Menu** subbranch) was *enabled*, every configuration option will display.

If *Full Mode* was *disabled*, only configuration options likely to change will display.

   The option sets (DSU, Diag, DBM, etc.) scroll from the last to the first (e.g., MUX→PrtSp→SAVE→DSU→Diag etc.).
3. Select **Prev** (press the ◁ key to display Prev, then select it).
4. Press the △ key to return to the *Edit/Save* screen.

   You can select another option set to view, or you can proceed.

   Refer to Chapter 5, *Configuring the Unit*, for an example showing you how to edit (change) configuration options.

5. Select **Save** (F1).

   The *Save to* screen appears.

6. Select **Activ** (F1).

   The selected application's configuration is saved to the DSU's Active operating area, and the *Command Complete* message appears.

Configuration Options

The Configuration Options (**Opts**) subbranch allows you to save, copy, and/or change configuration options. It also is the place where the DSU's ports are configured (or reconfigured) for EIA-232 or V.35 operation.

Refer to Chapter 5, *Configuring the Unit*. Chapter 5 fully explains the *Opts* subbranch, and provides an example of changing configuration options.

Reconfiguring a DSU Port

Select this procedure if your unit does not have a TDM/Flex installed and enabled.

▶ Procedure

1. Select the **Confg** (Configuration branch).
2. Press the F1 key to select **Opts** (Configuration Options subbranch).
3. Select **Activ** (Active), or one of the factory-set configurations (PTPC, PTPT, MPTC, or MPTT) from the *Load from* screen.
4. Press the ▷ key until *Gen* (General) appears above a function key (F1, F2, or F3).
5. Select **Gen**. (The first configuration option in the option set is *DTE Port*.)
6. Select **V.35** (the default is EIA232).

   The *DTE Port* setting changes to V.35.

7. Press the △ key to return to the *Edit/Save* menu.
8. Select **SAVE** (F1).
9. Select **Activ** (F1) from the *Save to* screen.

   Command Complete appears to confirm that the configuration is saved.

Reconfiguring a TDM/Flex Port

The *Connecting the DSU to a DTE* section of Chapter 2 tells you how to connect Port 2 if your DSU is equipped with a TDM/Flex.

With the TDM/Flex option, you can configure each port (Port 1 or Port 2) independently (e.g., one port can be configured for EIA-232 operation while other port is configured for V.35 operation – or vice versa).

The unit is shipped with both ports configured for EIA-232 operation.

To reconfigure a TDM/Flex port:

▶ Procedure

1. Select the **Confg** (Configuration branch).
2. Press the F1 key to select **Opts** (Configuration Options subbranch).
3. Select **Activ** (Active), or one of the factory-set configurations (PTPC, PTPT, MPTC, or MPTT) from the *Load from* screen.
4. Press the ◁ key until *MUX* appears above a function key.
5. Select **MUX** (F1).

   If the TDM/Flex is disabled, go to the next step. If the TDM/Flex is enabled, go to step 9.

6. Select **Setup** (F1).
7. For *MUX Funct*, select **Enab**.
8. Press the △ key to return to the *Change MUX Opts* menu.
9. Select **Prt1** (F3). (The first configuration option in the option set is *DTE Port*.)
10. Select **V.35** (the default is EIA232).

    The *DTE Port* setting changes to V.35.

11. Press the △ key to return to the *Change MUX Opts* menu.
12. Press the ▷ key to display *Prt2*.
13. Select **Prt2**.
14. Select **V.35**.
15. Press the △ key twice to return to the *Edit/Save* screen.

16. Select **SAVE** (F1).
17. *Save to* **Activ** (F1).

    Command Complete appears to confirm that the configuration is saved.

Poll List

The Poll List (**PList**) subbranch maintains or changes the DSU's poll list. A control DSU's poll list includes all tributary DSUs and DBMs one level downstream.

You can display, clear, change, or acquire a poll list. If you select **Clr** (Clear) from the *Poll List* screen, all network addresses are erased from the DSU's poll list.

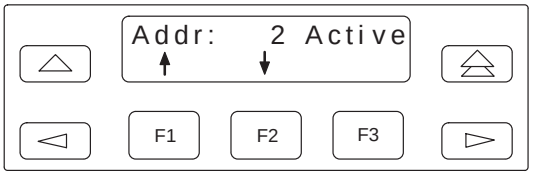
PList is *only available from the Local branch,* and only to a DSU configured for nondisruptive and mixed diagnostics (*Diag Type* is set to NonD or Mixed).

Displaying the Poll List

To display each of the network addresses included in the DSU's poll list:

▶ Procedure

1. Select **PList** (F2).
2. Select **Displ** (F1). The following screen appears:



   The number after Addr (in this example, 2) is the network address of the poll list member. The member is identified as either *Active* or *Skip* (identified via the Change Poll List function).

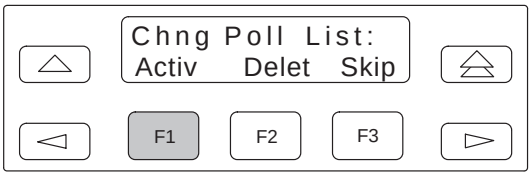
3. Press the **F1** or **F2** key to display additional addresses.
4. Press the △ key to return to the *Poll List* screen.

Changing the Poll List

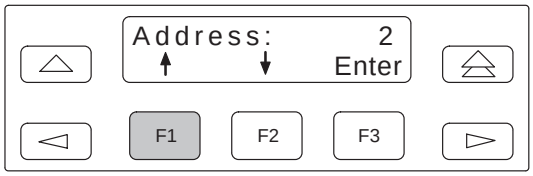
To change the poll list (e.g., add network address 3):

▶ Procedure

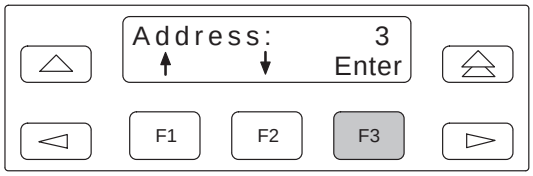
1. Select **Chang** (F3).



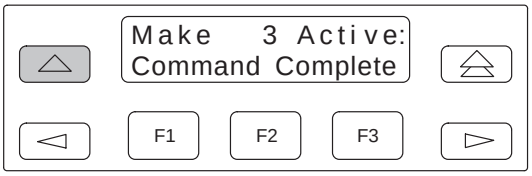
2. Select **Activ** (F1).



3. Press the **F1** key to increment network address 2.



4. Select **Enter** (F3).

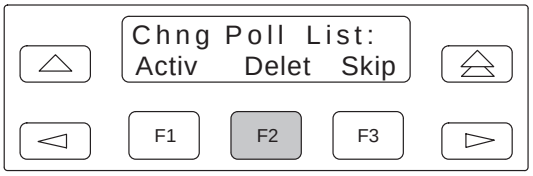


   The address is added to the poll list. The control determines the round trip delay, then sends that information to the tributary DSU.

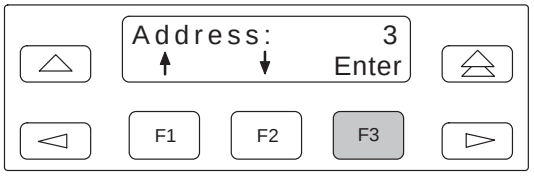
5. Press the △ key to return to the *Chng Poll List* screen.

To delete a network address (e.g., 3) from the poll list:

▶ Procedure

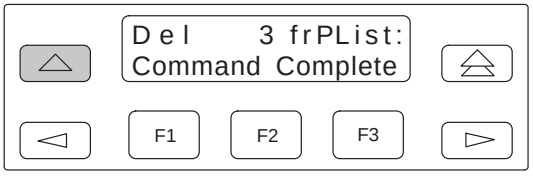


1. Select **Delet** (F2).



2. Select **Enter** (F3).

   In this example, 3 was just added, so it is the address displayed. If another address needs to be deleted, change the network address displayed as previously shown.

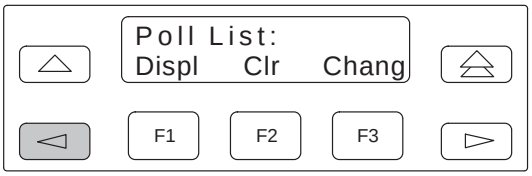


   The tributary DSU associated with the address is removed from the poll list.

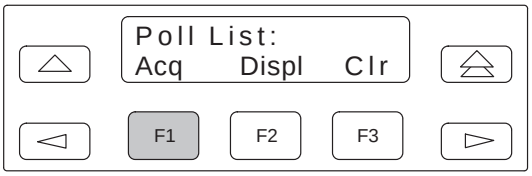
Acquiring the Poll List

To automatically generate a poll list:

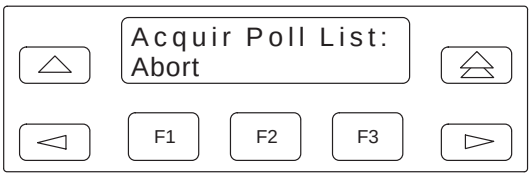
▶ Procedure



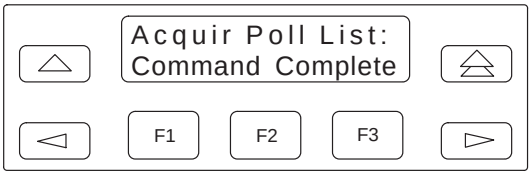
1. Press the ◁ key to display Acq.



2. Select **Acq** (F1).



   You can stop the process and keep the poll list as it has been generated by selecting **Abort**.



   Otherwise, all tributary addresses have been acquired.

Directory

The DSU's dial backup Directory (**Dir**) can store up to ten telephone numbers (dial strings) so the DBM can call other DBMs or modems. Directory entries are numbered from 1 to 10. Each dial string in the directory can be up to 36 characters in length. Refer to Table 4-6 for numbers and characters that can be used.

When the dial string or changes are complete, enter an underscore (_) to the immediate right of the last character; *this ends the dial string field.*

> **NOTE**
>
> Do not load duplicate telephone numbers into the Directory; telephone numbers should be unique.

Entering a Telephone Number

For the following example, we will add a dial string (telephone number) to Backup Directory 1. The number to be entered is 555-1234.

To add or change a telephone number:

▶ Procedure

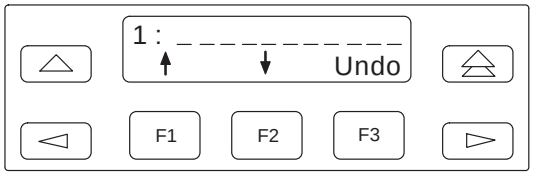
1. Select **Local**.
2. Press the ▻ key to display Confg (Configuration branch).
3. Select **Confg**.
4. Select **Dir** if entering a telephone number into the Backup Directory.

   Press the ▻ key to display then select **Phone** if entering the local DSU's telephone number. *This telephone number is entered similarly to entering a number into Dir.*
5. Select **Chang** (F1) to add or change a telephone number.

   The *Enter Dir* screen appears.

   Press the F1 key (↑) to increment the Directory entry indicator (the default is 1). *For this example, assume that you are entering your first directory entry.*
6. Select **Load** (F2).

The Directory entry appears on the first line; the cursor is positioned in the first position of the currently empty Directory.



If the number had been entered previously, that number would appear on the first line, following the colon (:).

For numeric screens, the following applies:

— Press the F1 key (↑) to increment the digit.

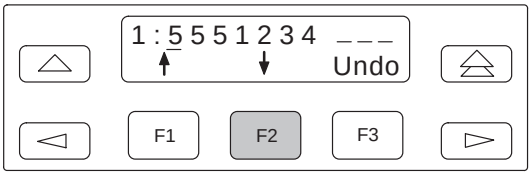
— Press the F2 key (↓) to decrement the digit.

— Press the ◅ or ▻ keys to move the blinking cursor one position to the left or right.

— Press the F3 key (Undo) to restore the number as it was first displayed so you can start over.

Refer to Table 4-6 to see all available directory and password entry characters.

7. Press the F1 key until the number **5** appears.
8. Press the ▻ key to move to the next position.
9. Repeat the process until all numbers in the telephone number have been entered.



> **NOTE**
>
> A dial string cannot have any separating characters or spaces (i.e., 555-1234 or 555 1234). *Other valid characters* can be interspersed as needed : *, #, t, p, w, and comma (,).

10. Press the △ key to return to the *Enter Dir* screen.
11. Press the F3 key to **Save** the entry.
12. Verify that the number was loaded by pressing the △ key again and selecting **Load** (F2).

The telephone number should appear as entered, or you can repeat the procedure to edit/correct your entry.

Table 4-6
Directory Entry and Password Characters

Character[1]	Use
0—9	Dialing digit
*	Tone-dialing character *
#	Tone-dialing character #
t	Tone dial
p	Pulse dial
w	Wait for dial tone
|	Delimiter, separating telephone number and callback directory pointer (for use with callback security)
, (comma)	In a dial string: a 2-second pause at the beginning of a password; suppresses display of all following characters (invisible mode)
( ) (space)	Space (readability character) [2]
_ (underscore)	Required character for end-of-string marker (erases end-of-line)

[1] The colon (:) character should not be entered from the NMS.
[2] Space is not used for directory entries.

Phone

The local telephone number (**Phone**) feature stores the local DBM's telephone number if a DBM is installed.

Refer to Table 4-6 to see all available telephone number characters.

Network Address

The network address (**Addr**) is the network address of the local DSU. *It is only available from the Local branch.* The DSU's network address is a number in the range of 1 to 254 if the DSU has a DBM installed. The DBM automatically acquires an address equal to the DSU's plus 1.

Assigning an Address

The *Addressing the Unit* sections of the installation chapters, Chapters 2 and 3, provide guidelines for assigning an address to the DSU based upon its position in the network – control or tributary. Follow the steps below to assign a network address to a DSU. Refer to the menu in Appendix A, if necessary.

▶ Procedure

1. Select **Confg** (Configuration branch) from the menu.

   (Press the ▷ key to scroll *Confg* into view, then press the function key (F3) directly below the branch name to select it.)

2. Press the ▷ key until *Addr* (Address) appears, then select **Addr**.
3. Select **Load**.

   Net Address appears, with the current network address displayed. (The DSU is shipped with its network address set to **254**.)

4. Change the DSU's network address by moving the blinking cursor and incrementing or decrementing the digits (1 through 9).

   Press the ▷ key – moves the cursor 1 position to the right.

   Press the ◁ key – moves the cursor 1 position to the left.

   Press the **F1** (↑) key – increments the digit by 1 (e.g., 1, 2, 3 ...).

   Press the **F2** (↓) key – decrements the digit by 1 (e.g., 1, 2, 3, ...).

5. Press the △ key to return to the *Net Address* screen when finished entering the DSU's address.

6. Select **Save** (F2).

   The DSU displays the address assigned along with a *Command Complete* message.

If an error was made in entering the address:

▶ Procedure

1. Press the △ key to return to the *Configure* screen.
2. Re-select **Addr**, and re-edit the address.
3. Select **Save** again.

Control Branch

The Control (**Ctrl**) branch allows you to enable or disable the DSU's transmitter, as well as the DBM's or port's, and to display or change the status of the general purpose external DTE leads. *A DBM can be disabled if it is addressed from the Remote branch.*

Transmitter Control

The Transmitter Control (**TxCtl**) selection allows you to enable or disable the DSU's, DBM's, or port's transmitter (DDS core).

When the DSU transmitter is disabled, the following is possible:

- When a DSU is disabled, it responds to tests. Aborting a test clears the test but the unit remains disabled.
- A DSU in test clears the test when a disable (or enable) command is received.
- If an enable command is executed to a control from the NMS or the local DCP, all disabled tributaries are enabled; all tributaries in test are restored to Data mode.

When the local DBM is disabled, the DBM does not originate or answer any calls until enabled.

LEDs

The **LEDs** selection is only available from the Local branch. This selection allows you to monitor the port at any given time. When selected, the port's lead activity is reflected in the DCP circuit designation status indicators (TXD, RXD, etc.) on the faceplate of the Model 3551 DSU, or on the DCP of the Model 3550 DSU.

External Leads

The External Leads (**ExtL**) selection allows you to display the state of *four* general-purpose leads on the EIA-232-D/V.24 Port 1 interface: Pins 12 and 13 for *output* (control leads) and Pins 19 and 23 for *input* (alarm leads).

When the configuration option *Ext Leads* (External Leads) is set to ExtLd, you can change the state of the two output leads from the DCP or a 6700 Series NMS. When *CCN by EL* (CCN by External Leads) is enabled, the control DSU reports changes in the four leads to the 6700 Series NMS as part of its health and status poll response.

Table 4-7 describes the meaning of the state of each input or output lead.

Displaying External Leads

The Display (**Displ**) selection allows you to view the external lead states. When Display is selected, the External Leads status report appears showing the current status of the general-purpose external leads on the EIA-232-D/V.24 interface.

Changing External Leads

The Change (**Chang**) selection allows you to change the state of the two output leads (for example, to change a lead to signal a console operator or to reset a remote computer). Leads can be changed from the NMS.

After the leads are set, press the F2 key to save the leads in the specified state.

Table 4-7
Lead States

Symbol	Meaning
_	Off (below text line)
¯	ON (above text line)
↕	Changing
?	Indicates an illegal value

NOTES:

Input leads A and B:

Off (_) when voltage on lead is less than +.8V.
ON (¯) when voltage on lead is more than +2.2V.

Output leads are either ON or Off:

When output is set to Off (_), –12V is applied to lead.
When output is set to ON (¯), +12V is applied to lead.

Reporting External Lead Changes to NMS

Changing either the *output leads* or the *input leads* changes the DSU's health and status message.

If the DSU is polled by the 6700 Series NMS, the NMS reports a change configuration notification (CCN) event. The NMS operator can then issue a **CCN Display** command to determine what caused the event.

- If the CCN event was caused by a change in the *external leads*, select **Displ** (F1) to see the current states of the leads.
- If a positive (+) voltage is detected in either one of the *input leads*, an external leads alarm is also reported.

Messages Branch

The Messages (**Msgs**) branch of the top-level menu allows the DSU to receive messages from the NMS. It only appears when there is a message waiting. Both control and tributary DSUs can receive messages.

To receive messages:

▶ Procedure

1. Press the **F3** key (Msgs).
2. Select **Read** (F1).
3. If the message is *less than* 16 characters in length, the entire message is displayed.

   If the message is *greater than* 16 characters, press the ▻ key to scroll additional lines of the message onto the screen.

To clear (delete) messages:

▶ Procedure

1. Press the **F3** key (Msgs).
2. Select **Clear** (F2).

   The message is deleted, and *Msgs* no longer appears over the F3 key.

Front Panel (DCP) Security

NOTE

This page can be removed to prevent unauthorized persons from learning about the security access levels and their selection.

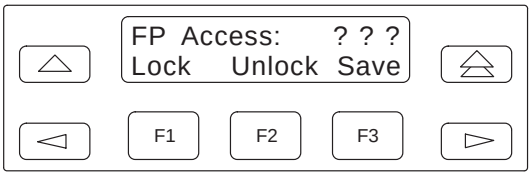
The Model 3550 diagnostic control panel (DCP) and Model 3551 shared diagnostic control panel (SDCP) have two levels of security access, as shown in Table 4-8.

Table 4-8
Security Access Levels

Security Access Level	Functions Available
Unlock	All
Lock	Local branch only: • Status branch • Configuration branch: Display only (no changes) • Control branch: Display External Leads only (no changes)

The 3550 Series DSUs are shipped from the factory with the security level set to Unlock. When the DCP is locked, only the Local branch appears on the control DSU.

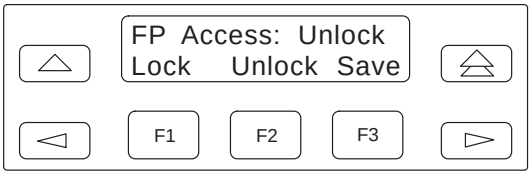
If the security has not been set on the DCP before, the following appears:



To select the security level:

▶ Procedure

1. Press the ⏏ key to ensure that you are at the top-level menu.
2. Press the ◁ and ▷ keys simultaneously for three seconds. The following menu appears:



3. Select the security level:

   Lock – To restrict access

   Unlock – To provide full access

   Press the appropriate function key (**F1** or **F2**).
4. Select **Save** (F3).

Configuring the Unit 5

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Using the DCP to Set Configuration Options 5-2
Editing Configuration Values 5-2
Saving Configuration Options 5-3
Example Using the DCP 5-3
Configuration Option Tables 5-5
Understanding the Tables 5-5

Overview

After the DSU has been installed and any necessary hardware switches or jumpers have been set, the software configuration options must be set. Configuration options are set via the DCP by accessing the Configuration (Confg) branch of the menu (refer to the menu tree in Appendix A).

There are seven configuration storage areas within the DSU:

- The active area (**Activ**) contains the configuration options currently being used by the DSU.
- The remote area (**Remt**) allows a selected DSU's configuration options to be retrieved. Once retrieved, they can be edited, and/or saved back to the selected DSU, another DSU, or the local DSU. Activ and Usr1 are the remote configuration option sets that can be retrieved.
- The user 1 area (**Usr1**) is a customer-defined set of stored configuration options. By predetermining and storing a frequently used configuration, the stored option set can be loaded quickly as operating requirements change.

NOTE

The PTPC, PTPT, MPTC, and MPTT areas are read-only storage areas (configuration option changes cannot be saved to these areas).

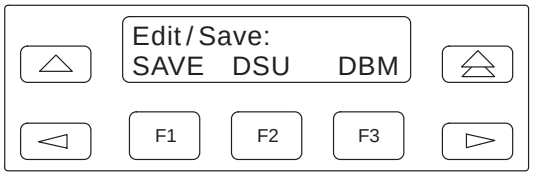
- The factory-loaded configuration option sets for a point-to-point control DSU are contained in the **PTPC** area.
- The factory-loaded configuration option sets for a point-to-point tributary DSU are contained in the **PTPT** area.
- The factory-loaded configuration option sets for a multipoint control DSU are contained in the **MPTC** area.
- The factory-loaded configuration option set for a multipoint tributary DSU are contained in the **MPTT** area.

NOTE

Load the appropriate option set (PTPC, PTPT, MPTC, or MPTT) when installing or upgrading the DSU.

Selecting Activ, Usr1, PTPC, PTPT, MPTC, or MPTT from the *Load from* screen brings a complete set of configuration options into the DSU's working buffer. These configuration options are grouped by their function. These groupings are referred to as *option sets.* Each of these option sets, or groupings, control a specific aspect of the DSU's operation.

Once loaded, the following *Edit/Save* submenu appears:



Press the ◁ or ▷ key to scroll the following configuration option sets into view: DSU, Diagnostic (DSU, DBM, External DBU, and General), DBM, External DBU, General, Backup, MUX (Copy, Setup, and Ports), and Port Speed (DSU, DBM, and External DBU).

If your unit *has a DBM installed*, the External DBU option sets will not appear. If your unit does *not have a DBM installed*, the DBM option sets will not appear. The Backup option set only appears when a DBM is installed or an *external* DBU is configured to originate backup; otherwise, the Backup option set will not appear. If the unit *does not have a TDM/Flex installed*, the MUX and Port Speed option sets will not appear.

Using the DCP to Set Configuration Options

Configuration options can be edited and saved to either the Activ or Usr1 areas. This section provides guidelines for using the DSU's diagnostic control panel (DCP) to perform these operations.

In addition, an example is included to illustrate DCP operation.

Editing Configuration Values

To edit or change configuration options:

▶ Procedure

1. Select **Local**, or **Remot** (Remote) and the remote DSU's network address.
2. Select **Confg** (Configuration branch).
   Press the ▷ key *key until Confg appears, then press the function key (F1, F2, or F3) directly below Confg.*
3. Select **Opts** (Configuration Options).
4. Select **storage area** (Activ, Remt, Usr1, etc.) from the *Load from* screen.

   If the unit is a control and you select **Remt**, enter the network address of the remote DSU.
5. Select the **option set** (e.g., DSU, Diag, DBM) to be edited.

   The first configuration option within that set appears. Page through each configuration option within the set as follows:

   a. Press the F1 key to go to the **Next** configuration option. *These configuration options scroll or wrap around (e.g. first, then last; or last, then first).*

   b. To return to the previous configuration option, press the ◁ key *instead of* selecting Next. **Prev** appears over the F1 key.

   c. Select **Prev** by pressing the F1 key.

As you edit configuration options, be aware of the following:

- The *first line* of each configuration option identifies the option and its current setting.

  If configuration data has been corrupted, **???** will appear in place of the current value. If this occurs, reset all configuration options, along with the network address. If a DBM is installed, check the Backup Directory entries, the poll list, and the DSU's local telephone number as well.
- The *second line* displays all values that are available for selection – three at a time, one above each function key.
  - — Press the ◁ or ▷ key to scroll other selections into view.
  - — Press the function key (**F1**, **F2**, or **F3**) directly below a value to select it.
  - — Select **Next** to proceed to the next option.
  - — Select **Prev** to return to a previous option.
  - — Press the △ key to return to the *Edit/Save* submenu or screen, and select the next option set to be edited.

Saving Configuration Options

CAUTION

Be extremely careful when saving configuration options to avoid saving them to the wrong location.

To save edited configuration options:

▶ Procedure

1. From any configuration option in any option set, press the △ key to return to the *Edit/Save* submenu.
2. Press the F1 key below **SAVE**.
3. Select **area** (Activ, Remt, Usr1) on the *Save to* screen.
   - *If **Activ** is selected*, your changes take effect immediately.
   - *If **Usr1** is selected*, your changes are stored for future use.
   - *If the unit is a control and **Remt** is selected*, the complete set (all option sets available to the unit) of configurations are sent to the tributary and saved to its *Activ* area.

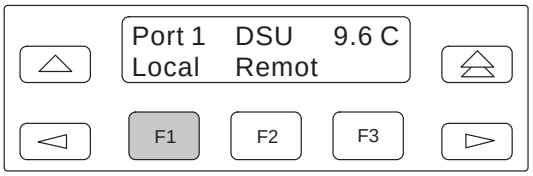
   Remember that you cannot save to the factory-loaded configurations.

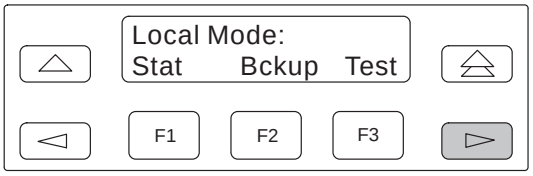
Example Using the DCP

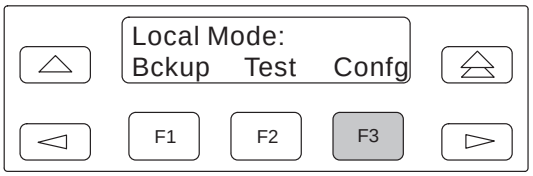
In this example, load the configuration options stored in the PTPT area, change Diagnostic Type (Diag Type) under the Diagnostic (DSU) option set from Disr to NonD, change DTE Port under the General option set from EIA232 to V.35, then save the changes to the Usr1 area, and return to the main or top-level menu.

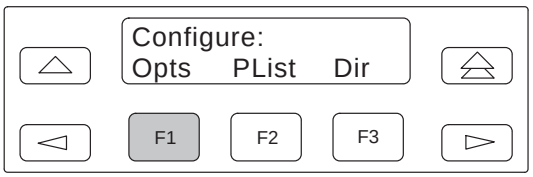
▶ Procedure

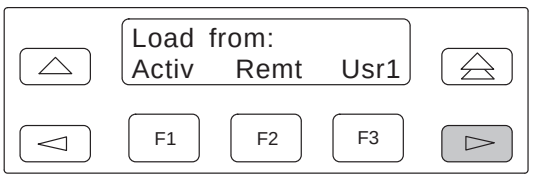
Press the DCP keys indicated by the shading.

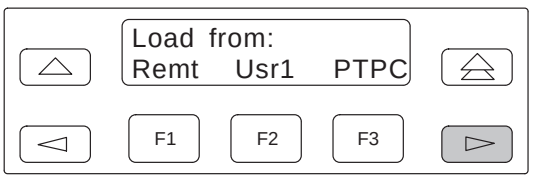


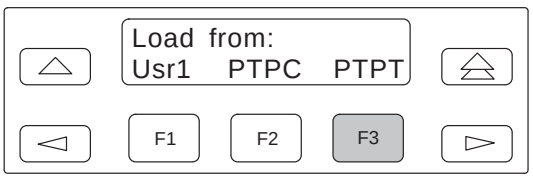


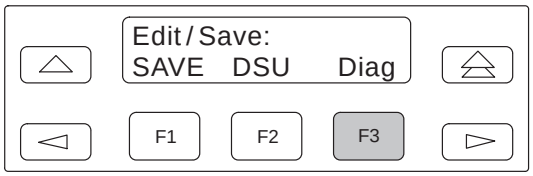








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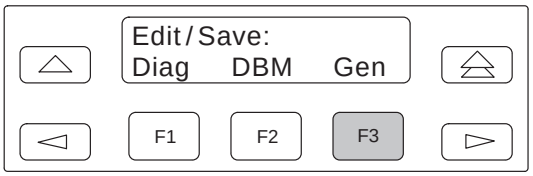
SAVE DSU Diag
F1
F2
F3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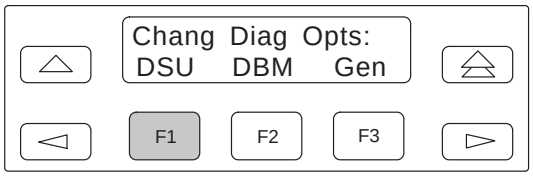
Diag DBM Gen
F1
F2
F3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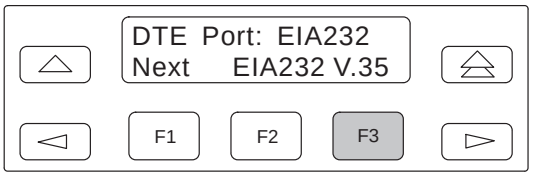
DSU DBM Gen
F1
F2
F3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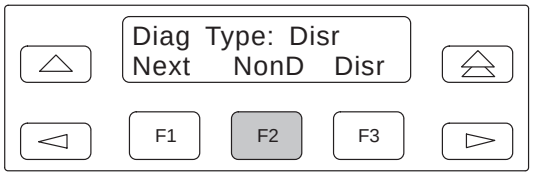
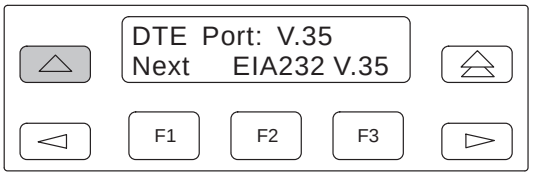
Next EIA232 V.35
F1
F2
F3


Diag Type: Disr
Next NonD Disr
F1
F2
F3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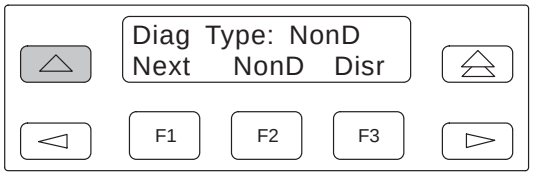
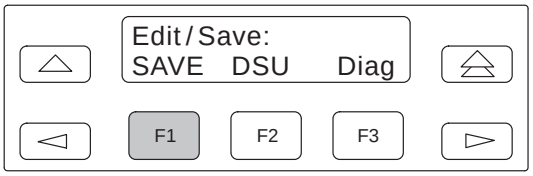
Next EIA232 V.35
F1
F2
F3


Diag Type: NonD
Next NonD Disr
F1
F2
F3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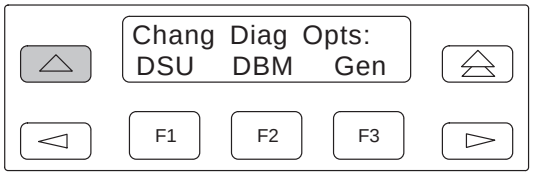
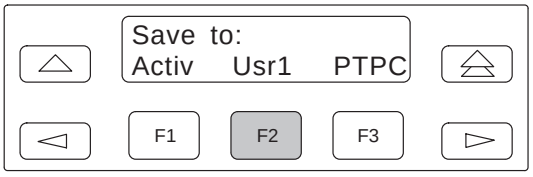
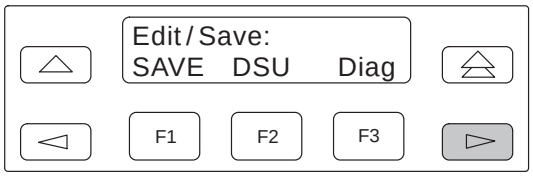
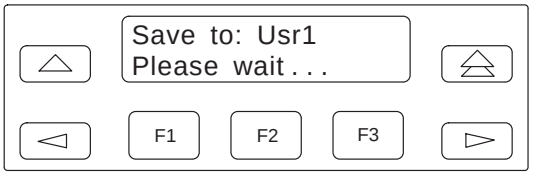
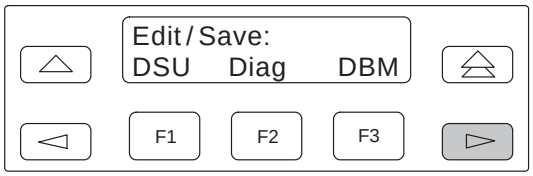
SAVE DSU Diag
F1
F2
F3

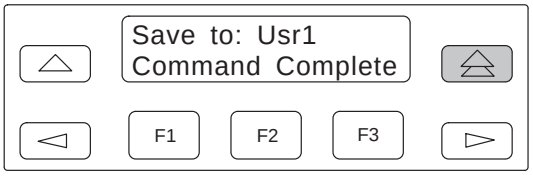

Chang Diag Opts:
DSU DBM Gen
F1
F2
F3

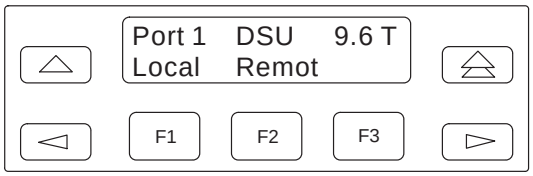

Save to:
Activ Usr1 PTPC
F1
F2
F3


Edit / Save:
SAVE DSU Diag
F1
F2
F3


Save to: Usr1
Please wait . . .
F1
F2
F3


Edit / Save:
DSU Diag DBM
F1
F2
F3


Save to: Usr1
Command Complete
F1
F2
F3



This example is now complete.

Configuration Option Tables

This section contains a table for each *option set* that can be found under the Configuration (Confg) branch, in the order in which it appears in the menu.

Each table lists all configuration options available within the option set when Menu mode is enabled (**Menu** subbranch – Full Mode: Enab). Appendix B provides Configuration Worksheets that summarize the configuration options when Menu mode is enabled, as well as when it is disabled.

This chapter includes the following option set tables:

- DSU Configuration Options (Table 5-1)
- Diagnostic (DSU) Configuration Options (Table 5-2)
- Diagnostic (DBM) Configuration Options (Table 5-3)
- Diagnostic (External DBU) Configuration Options (Table 5-4)
- Diagnostic (General) Configuration Options (Table 5-5)
- DBM Configuration Options (Table 5-6)
- External DBU Configuration Options (Table 5-7)
- General Configuration Options (Table 5-8)
- Backup Configuration Options (Table 5-9)
- MUX (Setup) Configuration Options (Table 5-10)
- MUX (Port) Configuration Options (Table 5-11)
- Port Speed (DSU) Configuration Options for DSU (Table 5-12)
- Port Speed (DBM) Configuration Options (Table 5-13)
- Port Speed (External DBU) Configuration Options (Table 5-14)

Understanding the Tables

Refer to the appropriate tables when configuring the DSU. Each configuration option is segmented into three sections: the option as it appears on the DCP, an explanation of the option, then the values that can be selected or set.

Each table shows each configuration option as it is displayed. As you refer to these tables, be aware of the following:

- The *first line* shows each **configuration option** as it appears on the DCP, followed by a colon (:), then the **default setting** (the value set at the factory).
- The *second line* shows all selectable values, which can be viewed on the DCP by scrolling to the left or right using the ◁ or ▷ key.

  The first selection is always **Next**, which allows you to go to the next configuration option in the set.

  The last selection is always **Prev**, which allows you to go back to the previous configuration option.

  Possible selections wrap around so you can immediately press the ◁ key to display *Prev*, saving key presses.

An explanation of that configuration option and its selectable values follow, which includes:

- The full or unabbreviated name of the configuration option, followed by a brief explanation of its purpose or function.
- The selectable values for the configuration option, which are listed with guidelines for when each should be selected.

Table 5-1
(1 of 2)
DSU Configuration Options

Rate(Kbps): 9.6
Next 64L 56 38.4 19.2 9.6 4.8 2.4 Prev

DSU Rate. Sets the data rate (in kbps) of the DSU, which must be set to match the speed of the digital (DDS) circuit.

64L — Select for 64 kbps LADS operation.

56 to 2.4 kbps — Set to match the speed of the DDS circuit.

NOTE: Both the control and tributary DSUs must be set to the same value.

PrtSp(Kbps): 9.6
Next 64 56 48 19.2 9.6 4.8 2.4 1.2 Disab Prev

Port Speed (not displayed with a TDM/Flex installed). Sets the speed of the DTE port interface. The port speed is set to any value *less than* or *equal to* the DSU Rate(Kbps) set above. The DSU performs rate adaption if the port speed is set to *less than the DDS rate*.

64 to 1.2 kbps — Select the DTE's port speed.

Disab — Disables PrtSp(Kbps).

TxClkSource: DDS
Next Int Ext Prt1 Prt2 DDS Prev

Transmit Clock Source. Specifies the transmit timing source for the DSU.

Int — Select internal clock source to take timing from the DSU.

Ext — Select external clock source when timing is taken from the external Transmit Timing lead on Port 1 only *(not displayed if a TDM/Flex is installed).*

Prt1 or Prt2 — Select the port that timing is to be taken from, using the selected port's external Transmit Timing lead *(Prt2 is only displayed if a TDM/Flex is installed and enabled).*

DDS — Select the DDS network when the DSU is connected to a DDS network and the network provides the timing, or when a LADS configuration with a remote DSU is providing the timing.

Msg Clamp: Enab
Next Enab Disab Prev

Message Clamping (only displayed when Full Mode is enabled). Controls data lead behavior when disruptive diagnostic tests and commands are received from the remote DSU. It applies to both the DSU and DBM.

Enab — Select to prevent diagnostic messages from reaching the DTE interface.

Disab — Select if the remote DSU is configured for switched RTS; that is, RTS Control is set to DTE in the General (Gen) configuration options.

TxElasStor: Disab
Next Enab Disab Prev

Transmit Elastic Store (only displayed when Full Mode is enabled and a TDM/Flex is not installed). Using a transmit buffer on the DSU's transmitted data (TXD) lead, serial data is clocked into the DSU's elastic store using clock provided by the extended circuit received clock lead. The DSU's own system timing is used to clock data out of the buffer.

Transmit Elastic Store is reset each time the unit powers-up, the buffer overflows, or after the RTS lead makes an Off-to-ON transition.

Enab — Select enable when interfacing with a DCE that receives clock from its own network source (e.g., a T1 MUX or DSU that is on the DDS network).

Disab — Select disable if you do not have an extended network or are providing the clock source to the extended network (e.g., LADS with external clock).

Table 5-1
(2 of 2)
DSU Configuration Options

RxElasStor: Disab Next Enab Disab Prev *Receive Elastic Store* (only displayed when Full Mode is enabled). The DSU receives data using a receive data buffer on the DSU's received data (RXD) lead. This configuration option only supports single-port DSUs configured for disruptive diagnostics (*Diag Type* is set to Disr) and no rate adaption – when *Rate(Kbps)* is equal to *PrtSp(Kbps*). Both the control and tributary DSUs must be configured the same. Enab — Select enable when interfacing with a DCE that receives clock from its own network source and does not support a Transmit Elastic Store. Disab — Select disable if you do not have an extended network.
19.2 PowrLvl: +6 Next +6 0 –10 Prev *19.2 kbps Power Level* (only displayed when Full Mode is enabled and when Rate(Kbps) is set to 19.2 kbps. This configuration option selects the appropriate power level, in dBm, for operation at 19.2 kbps. +6 — Select for DDS network service. 0 — Select for an alternate DDS service. –10 — Select for LADS operation.
V.54 Lpbk: Disab Next Enab Disab Prev *V.54 Loopback* (only displayed when Full Mode is enabled). Used in point-to-point configurations, this configuration option enables ITU-T V.54 Loopback operation. V.54 sequences are generated and detected on Port 1. Enab — Select enable if the DTE generates V.54 loopback sequences, or if the DSU is communicating with a DSU that is not a Model 3550 or 3551 that supports V.54 signaling. Disab — Select disable if the DTE does not support V.54 loopback sequences, or the other DSUs do not support V.54 signaling.

Table 5-2
Diagnostic (DSU) Configuration Options

Diag Type: Disr
Next NonD Disr Mixed None Prev

Diagnostic Type. This configuration option defines the diagnostic interaction between control and tributary DSUs. All DSUs on the same circuit should be set the same (e.g., if the control is set to NonD, all its tributaries should also be set to NonD).

NonD — Select nondisruptive diagnostics for diagnostic data to be transmitted between the control and the tributary DSUs over a separate diagnostic channel.

Disr — Select disruptive diagnostics for diagnostic data to be carried between the control and the tributary DSUs over the same (primary) channel as user-transmitted data. User-initiated commands are sent between the control and the tributary DSUs disruptively, interrupting data.

Mixed — Select if operating over a multipoint network. This setting supports nondisruptive health and status updates, but user-initiated commands are sent between the control and the tributary DSUs disruptively, interrupting data.

None — Select none if only local diagnostics are to be allowed; that is, there will be no diagnostic communications with remote devices.

2nd Ch(bps): 400
Next 100 400 800 1200 1600 Prev

In-band Secondary Channel Diagnostic Transport Speed in bps (only displayed when Diag Type is set to NonD and Full Mode is enabled). This configuration option allocates the DSU's port bandwidth when there is no excess bandwidth available for in-band secondary channel transport (used for diagnostic data) operation.

How to Select Bandwidth: Select one of the valid diagnostic speeds from the table below for the DSU's port and the DDS line's speed, as specified in the *Rate(Kbps)* configuration option under the DSU option set. (Example: If the DSU's *Rate(Kbps)* configuration option is set to 9.6 kbps, you can select 100, 400, 800, 1200, or 1600. If you select 400, the resulting DSU port speed will be 9.2 kbps.)

NOTE: When The TDM/Flex is operating at a line rate **greater than** 19.2 kbps or with a multipoint configuration, 100 bps is **not** a valid in-band secondary channel transport rate.

If the DSU *Rate(Kbps)* is equal to Port Speed, or if the underspeed port speed and sum of the TDM/Flex ports is equal to the aggregate speed on the DSU:	Valid diagnostic speeds are:
1.2	100, 400
2.4	100, 400, 800
4.8	100, 400, 800, 1200, 1600
9.6	100, 400, 800, 1200, 1600
19.2	100, 400, 800, 1200, 1600
38.4	100, 400, 800, 1200, 1600
48	100, 400, 800, 1200, 1600
56	100, 400, 800, 1200, 1600
64	100, 400, 800, 1200, 1600

Table 5-3
Diagnostic (DBM) Configuration Options

Diag Type: Disr
Next NonD Disr Mixed None Prev

Diagnostic Type. This configuration option defines the diagnostic interaction between control and tributary DSUs that are in backup. All DSUs on the same circuit should be set the same (e.g., if the control is set to NonD, all its tributaries should also be set to NonD).

NonD — Select nondisruptive diagnostics for diagnostic data to be transmitted between the control and the tributary DSUs over a separate diagnostic channel.

Disr — Select disruptive diagnostics for diagnostic data to be carried between the control and the tributary DSUs over the same (primary) channel as user-transmitted data. User-initiated commands are sent between the control and the tributary DSUs disruptively, interrupting data.

Mixed — Select if operating over a multipoint network. This setting supports nondisruptive health and status updates, but user-initiated commands are sent between the control and the tributary DSUs disruptively, interrupting data.

None — Select none if only local diagnostics are to be allowed; that is, there will be no diagnostic communications with remote devices.

2nd Ch(bps): 400
Next 100 400 800 1200 1600 Prev

In-band Secondary Channel Diagnostic Transport Speed in bps (only displayed when Diag Type is set to NonD and Full Mode is enabled). This configuration option allocates the DBM's port bandwidth when there is no excess bandwidth available for in-band secondary channel transport (used for diagnostic data) operation.

How to Select Bandwidth: Select one of the valid diagnostic speeds from the table below for the DBM's port and the DBM's rate, as specified in the *Rate(Kbps)* configuration option under the DBM option set. (Example: If the DBM's *Rate(Kbps)* configuration option is set to 9.6 kbps, you can select 100, 400, 800, 1200, or 1600. If you select 400, the resulting DBM port speed will be 9.2 kbps.)

NOTE: When The TDM/Flex is operating at a line rate **greater than** 19.2 kbps or with a multipoint configuration, 100 bps is **not** a valid in-band secondary channel transport rate.

If the DBM *Rate(Kbps)* is equal to Port Speed, or if the underspeed port speed and sum of the TDM/Flex ports is equal to the aggregate speed on the DBM:	Valid diagnostic speeds are:
1.2	100, 400
2.4	100, 400, 800
4.8	100, 400, 800, 1200, 1600
9.6	100, 400, 800, 1200, 1600
12.0	100, 400, 800, 1200
14.4	100, 400, 800, 1200, 1600

Table 5-4
Diagnostic (External DBU) Configuration Options

Diag Type: Disr
Next Disr None Prev

Diagnostic Type. This configuration option defines the diagnostic interaction between control and tributary DSUs that are in backup using an *external* dial backup unit (DBU). All DSUs on the same circuit should be set the same (e.g., if the control is set to Disr, all its tributaries should also be set to Disr).

Disr	—	Select disruptive diagnostics for diagnostic data to be carried between the control and the tributary DSUs over the same (primary) channel as user-transmitted data. User-initiated commands are sent between the control and the tributary DSUs disruptively, interrupting data.
None	—	Select none if only local diagnostics are to be allowed; that is, there will be no diagnostic communications with remote devices.

Table 5-5
(1 of 2)
Diagnostic (General) Configuration Options

Position: Cntrl *or* Trib
Next Cntrl Trib Prev

Network Position. This configuration option determines the DSU's position in the network, as well as its test and diagnostic capabilities.

Cntrl	—	Select if the DSU is a control (PTPC or MPTC configuration).
Trib	—	Select if the DSU is a tributary (PTPT or MPTT configuration).

LinkConfig: Pt-Pt *or* M-Pt
Next Pt-Pt M-Pt Prev

Link Configuration. Used to define a point-to-point or multipoint circuit, this configuration option is required for proper testing, dial backup, unit operation, and is required when using nondisruptive diagnostics.

Pt-Pt	—	Select for a point-to-point configuration (PTPC or PTPT configuration).
M-Pt	—	Select for a multipoint configuration (MPTC or MPTT configuration).

Resp Period: 1
Next 1 2 10 Prev

Response Period (only displayed when any Diag Type is set to NonD or Mixed, LinkConfig is set to M-Pt, and Full Mode is enabled). Used for single-port multipoint applications and applicable to *tributary* DSUs and DBMs only. This configuration option determines how often health and status messages are transmitted, which are transmitted each time the Request-to-Send (RTS) lead is raised.

1	—	Select if you want the tributary DSU to transmit health and status information *every time* RTS is raised (*not* applicable for PTPC, PTCT, or MPTC configurations).
2	—	Select if you want the tributary DSU to transmit health and status information *every other time* that RTS is raised.
10	—	Select if you want the tributary DSU to transmit health and status information *every 10th time* that RTS is raised.

Table 5-5
(2 of 2)
Diagnostic (General) Configuration Options

TribTimOut: 0:10
Next Chang Prev

Tributary Time-out, specified in minutes and seconds (only displayed when any Diag Type is set to NonD or Mixed, LinkConfig is set to M-Pt, and Full Mode is enabled). This configuration option specifies the amount of time that the control DSU or DBM waits before it generates a Tributary Time-out alarm when a tributary does not return a health and status message when RTS is raised (*only* applies to a MPTC configuration).

Chang — Determine the amount of time it takes for the control DSU to complete its polling cycle, then multiply that time by the response period entered above (Resp Period). The range that can be entered is from 5 seconds up to 10 minutes.

Link Delay: 0s
Next 0s 1s 2s 5s 10s 20s 50s Prev

Link Delay, specified in seconds (only displayed when any Diag Type is set to NonD, LinkConfig is set to Pt-Pt, and Full Mode is enabled). Used only in point-to-point configurations, this configuration option controls the amount of additional time that a DSU or DBM will wait for a response from a device downstream (*only* applies to a PTPC configuration).

NOTE: If diagnostic time-outs are occurring during polling, increase the link delay to the next higher setting.

0s to 50s — Set the number of seconds the DSU or DBM will wait for a response from the downstream device. The range that can be entered is from 0 seconds up to 50 seconds.

Packet Delay: 0s
Next 0s 1s 2s 5s Prev

Packet Delay, specified in seconds (only displayed when Position is set to Cntrl and Full Mode is enabled). Used only for a control DSU or DBM, this configuration option controls the amount of time that a DSU or DBM will wait for a packet to complete from an NMS.

NOTE: Must be used when the DSU's diagnostic channel operates over packet switch, satellite communications, or other facilities that provide extended throughput delays.

0s to 5s — Set the amount of time the DSU or DBM will wait for the NMS. The range that can be entered is from 0 seconds up to 5 seconds.

M-PtSymPrt:Enab
Next Enab Disab Prev

Multipoint Symmetrical Port (only displayed when LinkConfig is set to M-Pt and Full Mode is enabled). Used only in a multipoint configuration, This configuration option enables rate adaption in the tributary DSU to control direction on a multipoint circuit. An example of multipoint rate adaption would be when the port speed is *less than* the line speed (*only* applies to MPTC and MPTT configurations).

Use this configuration option when using multipoint rate adaption, or when the transmit data rate must match the received data rate, or the tributary DSU is configured as a digital-sharing device (DSD).

Enab — Select when multipoint rate adaption is enabled, and when a multipoint network is configured for nondisruptive diagnostics (*Diag Type* is set to NonD) and a symmetrical port speed is required for proper DTE operation.

Disab — When disabled, the receive port rate on the control will be the DDS rate, and the transmitter will be the port rate, minus the diagnostics.

Table 5-6
(1 of 4)
DBM Configuration Options

Rate(Kbps): 9.6
Next 14.4 12.0 9.6 4.8 2.4 Prev

DBM Rate. Sets the initial data rate (in kbps) of the DBM for backup calls over the dial circuit.

14.4 to 4.8 kbps — Select the data rate for V.32bis modulation. The rate 14.4 is not displayed if you have a 12.0 kbps DBM.

2.4 — Select for V.22bis modulation.

PrtSp(Kbps): 9.6
Next 14.4 12.0 9.6 4.8 2.4 1.2 Disab Prev

Port Speed (not displayed with a TDM/Flex installed and enabled). Sets the speed of the DTE port interface. The port speed is set to any value *less than* or *equal to* the DBM Rate(Kbps) set above. The DBM performs rate adaption if set to *less than* the DBM port rate.

14.4 to 1.2 kbps — Select the port speed for the DBM; 14.4 will not appear for a 12.0 kbps DBM.

Disab — Select disable to set the port speed to 0.

TxClkSource: Int for a control DBM; RXC for a tributary DBM
Next Int RXC Ext Prt1 Prt2 DSU Prev

Transmit Clock Source. Specifies the transmit timing source for the DBM.

Int — Select internal clock source to take timing from the DBM. This setting is used primarily in point-to-point applications.

RXC — Select receive clock source to take timing from the remote DBM's clock source.

Ext — Select external clock source when timing is taken from the external Transmit Timing lead on Port 1 *(not displayed if a TDM/Flex is installed).*

Prt1 or Prt2 — Select the port that timing is to be taken from, using the selected port's external Transmit Timing lead *(displayed if a TDM/Flex is installed and is enabled).*

DSU — Select the DSU's clock source when connected to a DDS network and the network is to provide the timing. *Do not select DSU if the DSU and the DBM operate at different rates.*

CarrLossDisc: Yes
Next Yes No Prev

Carrier Loss Disconnect (only displayed when Full Mode is enabled). Controls whether the DBM terminates a call when receive signal carrier is lost, or when the signal is no longer acceptable.

Yes — Select when you want to terminate the backup call when the carrier is lost.

No — Never select; for factory testing only. Selecting No will cause an off-hook line condition, which will result in excessive telephone charges.

Auto Retrain:Yes
Next Yes No Prev

Automatic Retrain (only displayed when Full Mode is enabled). Controls whether the DBM will start a retrain sequence automatically when received signal quality is no longer acceptable.

Yes — Select if you want the DBM to retrain automatically.

No — Select if you *do not* want the DBM to retrain automatically. However, the DBM will respond to a retrain request from a remote modem or DBM.

Table 5-6
(2 of 4)
DBM Configuration Options

Single Rate: Yes
Next Yes No Prev

Single Rate (only displayed when Full Mode is enabled). Determines whether the DBM will adjust its rate to resolve a rate mismatch with a remote DBM or modem with the following limitations.

NOTE: If the DBM Rate(Kbps) is set to 2.4, the DBM will only train at 2.4 kbps and can only talk to a 2.4 kbps modem, regardless of how Single Rate is set.

Yes — Select when you want the DBM to only operate at the rate for which it is configured.
No — Select when you want the DBM to adjust its rate downward to correct a rate mismatch.

AutoAnswer: Enab
Next Enab Disab Prev

Automatic Answer (only displayed when Full Mode is enabled). Controls whether the DBM answers incoming calls.

Enab — Select if the DBM is to automatically answer incoming calls.

Disab — Select if the DBM is *not* to automatically answer incoming calls.

TxElasStor: Disab
Next Enab Disab Prev

Transmit Elastic Store (only displayed when Full Mode is enabled and a TDM/Flex is not installed). Using a transmit buffer on the DBM's transmitted data (TXD) lead, serial data is clocked into the DBM's elastic store using clock provided by the extended circuit received clock lead. The DBM's own system timing is used to clock data out of the buffer.

Transmit Elastic Store is reset each time the unit powers-up, the buffer overflows, or after the RTS lead makes an Off-to-ON transition.

Enab — Select enable when interfacing with a DCE that receives clock from its own network source (e.g., a T1 MUX or DSU that is on the DDS network).

Disab — Select disable if you do not have an extended network or are providing the clock source to the extended network (e.g., LADS with external clock).

RxElasStor: Disab
Next Enab Disab Prev

Receive Elastic Store (only displayed when Full Mode is enabled). The DBM receives data using a receive data buffer on the DBM's received data (RXD) lead. This configuration option only supports single-port DBMs configured for disruptive diagnostics (*Diag Type* is set to Disr) and no rate adaption – when *Rate(Kbps)* is equal to *PrtSp(Kbps*). Both the control and tributary DBMs must be configured the same.

Enab — Select enable when interfacing with a DCE that receives clock from its own network source and does not support a Transmit Elastic Store.

Disab — Select disable if you do not have an extended network.

Table 5-6
(3 of 4)
DBM Configuration Options

Call Setup:None
Next None Pswrd Cllbk Alarm Prev

Dial Backup Call Setup (only displayed when Full Mode is enabled). Establishes the level of security for call setup attempts. This configuration option prevents an invalid call from causing the DSU to switch data to the DBM.

None	—	Select for outgoing calls when no security is needed. If a Model 3550 or 3551 DBM calls, the unit automatically switches to Dial Backup mode. If a non-Model 3550 or 3551 DBM calls, the unit remains in Standby mode for 15 seconds before switching to Dial Backup mode.
Pswrd	—	Select when both the originating and answering DBMs must exchange valid passwords to establish a call. This is an intermediate security level. Both devices must be either Model 3550 or 3551 DSUs and DBMs.
Cllbk	—	Select when you want the highest level of security. When this security level is set, the originating and answering DBMs exchange passwords, then disconnect. The answering DBM then calls the originating DBM back and there is a second exchange of passwords. Both devices must be either Model 3550 or 3551 DSUs and DBMs.
Alarm	—	Select when the DBM is to answer incoming calls only after the DSU reports a Facility Alarm. No security checking is performed. (This feature is provided for customers that provide data services to other customers that may not have Model 3550 or 3551 DSUs and DBMs.)

RxPwd: password
Next Chang Prev

Receive Password (only displayed when Call Setup is set to Callbk or Pswrd, and when Full Mode is enabled). The DBM expects to receive a password from the remote DBM. This password *must be* the remote DBM's transmit password (TxPwd). The maximum password length is 10 characters. Refer to Chapter 4 for available password characters.

Chang	—	Select and then enter the remote DBM's transmit password as the local DBM's receive password. For passwords less than 10 characters long, enter an underscore (_) to the immediate right of the last character in the password. *To make the password invisible from the DCP, enter a comma (,) as the first character.*

TxPwd: password
Next Chang Prev

Transmit Password (only displayed when Call Setup is set to Callbk or Pswrd, and when Full Mode is enabled). The DBM expects to transmit a password to the remote DBM. This password *must be* the remote DBM's receive password (RxPwd). The maximum password length is 10 characters. Refer to Chapter 4 for available password characters.

Chang	—	Select and then enter the remote DBM's receive password as the local DBM's transmit password. For passwords less than 10 characters long, enter an underscore (_) to the immediate right of the last character in the password. *To make the password invisible from the DCP, enter a comma (,) as the first character.*

Table 5-6
(4 of 4)
DBM Configuration Options

V.13 Signl: Enab for MPTC and MPTT; Disab for other configurations
Next Enab Disab Prev

V.13 Signaling (only displayed when Full Mode is enabled). V.13 signaling applies to the DBM when the DBM is in Dial Backup mode. The normal RTS/CTS delay is 14 ms at 2.4 kbps and 11 ms at all other speeds when V.13 is enabled. It is under 2 ms when V.13 is disabled.

For the V.13 sequence to be generated by a *tributary* DBM, the following must be set: RTS Cntrl must be set to DTE, CTS Cntrl set to Std or Delay. For the V.13 sequence to function at the *control* DBM, the following must be set: LSD Lead must be set to Std.

NOTE: Although this configuration option must be enabled in both the tributary and control DSUs in order to use V.13 signalling, RTS Cntrl propagation only occurs in the tributary-to-control direction.

Enab — Select when backing up a circuit that is configured for nondisruptive or mixed diagnostics or rate adaption. When enabled at both ends, LSD is turned ON at the control while RTS is ON at the tributary, and is turned Off when RTS is turned Off at the tributary DBM. The V.13 sequence is sent over the network to tell the control to turn ON LSD (*only* for a MPTC or MPTT configuration).

Disab — Select when configured for point-to-point nondisruptive diagnostics or point-to-point rate adaption; V.13 Signaling is turned Off.

Dial Test:Disab
Next Enab Disab Prev

Dial Tone Test (only displayed when Full Mode is enabled). When enabled, the DBM periodically checks for a signal or dial tone. If the test fails, the DSU reports a Dial Test Failure alarm in its health and status reports. A Dial Test occurs once every 60 minutes until a failure occurs. Then, the test repeats every minute until the network recovers.

Enab — Select to perform a Dial Tone testing.

Disab — Set to Disable if the DBM is not to perform Dial Tone testing.

DTRCallCon:Disab
Next Ansr Disab Prev

Data Terminal Ready Call Control (only displayed when Full Mode is enabled). DTRCallCon uses the state of the DTR lead to control backup when contact with the remote DSU is lost.

Ansr — Select answer when the DTR lead is used for *incoming* calls. The DBM answers a backup call from the remote DBM when DTR is raised. It drops the call when DTR goes low or will not answer an incoming call if DTR is low.

Disab — Select to disable DTR Call Control; the state of the DTR lead is ignored.

Table 5-7
External DBU Configuration Options

ExtBU: None Next Ansr Orig None Prev		
External Backup Unit. This feature allows dial backup for a DSU using an *external* dial backup unit (DBU).		
Ansr	—	Select for the *external* DBU to answer an incoming dial backup call.
Orig	—	Select for the *external* DBU to originate dial backup. Only when the *external* DBU is set to Orig will the Backup option set be available. The *external* DBU must be set for Dial on DTR.
None	—	Select to disable the *external* DBU. This is the default setting.
Rate(Kbps): 9.6 Next 64 56 38.4 28.8 19.2 14.4 9.6 4.8 2.4 1.2 Disab Prev		
Backup Rate for the External Dial Unit (DBU).		
64 to 1.2 kbps	—	Select the data rate to match the *external* DBU's port speed.
TxClkSource: DCE Next DCE Prt1 Prt2 Prev		
Transmit Clock Source. Specifies the transmit timing source for the *external* DBU.		
DCE	—	Select if clock is provided by the *external* DBU.
Prt1 or Prt2	—	Select the port that timing is to be taken from, using the selected port's external Transmit Timing lead *(Prt2 is only displayed if a TDM/Flex is installed and enabled).*

Table 5-8
(1 of 4)
General Configuration Options

DTE Port: EIA232
Next EIA232 V.35 Prev

DTE Port (not displayed when a TDM/Flex is installed and enabled). Selects the active DTE interface.

EIA232 — Select when using the EIA-232 interface (connector). EIA232 operation is recommended for speeds 19.2 kbps or below. Operation at speeds up to 56 kbps is dependent upon cable length, cable quality, and the local environment.

V.35 — Select when using the V.35 interface (connector). Operation at available rates for distances up to 1000 feet.

RTS Cntrl: DTE for MPTT; FrcOn for other configurations
Next FrcOn DTE Prev

Request-to-Send Control. This configuration option determines how the DSU will function with respect to the RTS lead. If set to FrcOn, the DSU internally forces the RTS lead ON; if set to DTE, the DSU sends control mode idle (CMI) whenever RTS is Off, and data mode idle (DMI) when RTS is ON.

FrcOn — Select for PTPC, PTPT, and MPTC configurations. With this setting, the DSU internally forces data mode idle (DMI), regardless of whether RTS at the DTE interface is ON or Off.

DTE — Select for MPTT configuration. This setting causes the DSU to send a control mode idle (CMI) signal whenever RTS is Off, and a data mode idle (DMI) signal when RTS is ON.

CTS Cntrl: Std
Next Std =RTS Delay FrcOn Prev

Clear-to-Send Control. Controls the behavior of the CTS lead when abnormal conditions are present (e.g., No Signal or Test Mode), as determined by the configuration options RTS Cntrl and Circ Assur.

Std — Select for all factory-loaded configurations (PTPC, PTPT, MPTC, and MPTT) so that the DSU responds to abnormal conditions. When selected, CTS follows RTS except when the DSU is in Test Mode, or an alarm or CMI is being received, and *Circ Assur* is set to Enab.

=RTS — When selected, CTS follows RTS regardless of whether Test Mode, an alarm, or CMI is being received.

Delay — Select when using automatic backup. Selecting Delay is the same as selecting Std except that when an alarm is received, CTS does not go low (drop) until the DBM or *external* DBU has failed to backup in the time allotted by the *Tries Time-Out* (in the Backup options set) setting. Make sure that *Auto Backup* (in the Backup option set) is enabled.

FrcOn — When Forced On is selected, CTS remains ON as long as the DSU is receiving power.

AntiStream:Disab
Next Chang Prev

Antistreaming (only displayed when Full Mode is enabled, and a TDM/Flex is not installed). Antistreaming provides circuit protection against a streaming DTE (a defective DTE that has its RTS lead constantly turned ON) by clamping the RTS lead of the tributary DSU.

Antistreaming only takes effect when *RTS Cntrl* is set to DTE; it is disabled when *RTS Cntrl* is set to FrcOn.

Chang — Set timer to any value from 1 to 100 second(s), in increments of 1; or to Disab when streaming terminal detection is not needed.

Table 5-8
(2 of 4)
General Configuration Options

LSD Lead: Std
Next Std Delay FrcOn Prev

Line Signal Detect Lead (only displayed when Full Mode is enabled). Controls behavior of the LSD lead.

Std — Select standard so that the LSD lead goes Off when a control mode idle (CMI) signal is received from the DDS network, or there is a DDS failure.

Delay — Select only if you do not want the DSU to respond to a network alarm condition or CMI signal. When selected, LSD only goes Off after repeated call attempts fail, and the period of time set in *Tries Time-out* (in the Backup option set) expires. Make sure that *Auto Backup* (in the Backup option set) is enabled.

FrcOn — Select to keep LSD on as long as the DSU has power.

DSR FrcOn: Enab
Next Enab Disab Prev

Data Set Ready Forced On (only displayed when Full Mode is enabled, and a TDM/Flex is not installed). Provides the ability to override any other options controlling the DSR lead.

Enab — Select for DSR to remain ON as long as the device is working, regardless of any tests or network alarms.

Disab — Select if DSR is to function as an active lead, reflecting various test and alarm conditions.

SystemStat: Enab
Next Enab Disab Prev

System Status (only displayed when Full Mode is enabled). Controls the behavior of the DSR lead in response to a No Signal, Out-of-Service, or Out-of-Frame alarm from the network.

Enab — Select if a network alarm is to turn DSR Off.

Disab — Select if a Model 3551 DSU with a V.32 DBM that is configured with its *Primary Core* configuration option set to Yes (DBM option set) is part of your network configuration. When selected, a network alarm will not affect DSR.

DSR on Tst: Enab
Next Enab Disab Prev

Data Set Ready On in Test (only displayed when Full Mode is enabled, and a TDM/Flex is not installed). Controls the behavior of the DSR lead during testing.

Enab — Select so that DSR is ON continuously during testing, allowing a DTE that relies on DSR being ON to send test messages to the DSU.

Disab — Select so that DSR is Off during testing.

Circ Assur:Disab
Next Enab Disab Prev

Circuit Assurance (only displayed when LinkConfig is set to Pt-Pt and Full Mode is enabled). Controls behavior of the CTS lead in response to a data signal from the network. If CTS Cntrl is set to =RTS or FrcOn, this configuration option is ignored.

Enab — Select to have the DSU turn Off the CTS lead if a control mode idle (CMI) signal is received.

Disab — Select if the DSU is to be unaffected by the CMI.

RespondRDL:Disab for MPTC; Enab for all other configurations
Next Enab Disab Prev

Respond to Remote Digital Loopback (only displayed when Full Mode is enabled). Determines whether the DSU responds to a V.54 Remote Loopback request.

Enab — Select to perform a Digital Loopback.

Disab — Select to ignore the Loopback command.

Table 5-8
(3 of 4)
General Configuration Options

LL by DTE: Disab
Next Enab Disab Prev

Local Loopback by DTE (only displayed when Full Mode is enabled). Controls the use of Pin 18 of the EIA-232-D/V.24 interface or Pin L of the V.35 interface by the DTE to initiate a Local Loopback when the DSU is the active device. Whenever this lead is ON, the Local Loopback overrides any other diagnostic tests run by the network.

Enab — Select if the DTE is to signal the DSU to perform a Local Loopback. Local Loopback ends when the signal is dropped.

Disab — Select if Local Loopback requests are to be ignored.

RL by DTE: Disab
Next Enab Disab Prev

Remote Digital Loopback by DTE (only displayed when Full Mode is enabled). Allows the DTE to initiate a Remote Digital Loopback via Pin 21 of the EIA-232-D/V.24 interface or Pin N of the V.35 interface.

Enab — Select if the DTE is to force the DSU to request a Remote Digital Loopback when the signal is turned ON. Remote Digital Loopback ends when the signal is dropped.

Disab — Select if the DSU is to ignore requests for a Remote Digital Loopback.

Bilat Lpbk:Disab
Next Enab Disab Prev

Bilateral Loopback (only displayed when Full Mode is enabled). If this configuration option is enabled, a DTE Loopback occurs when a Digital Loopback occurs.

Enab — Select for a DTE Loopback to be run whenever a Digital Loopback occurs.

Disab — Select for the DSU to ignore requests for a Bilateral Loopback.

Ext Leads: Rate
Next ExtLd Rate RPowr Prev

External Leads (only displayed when Full Mode is enabled). Controls the use of the general-purpose leads on the EIA-232-D/V.24 interface for Port 1, except when Rate is selected. These leads can be controlled and monitored from the DCP or from a 6700 Series NMS.

ExtLd — Select to enable Pin 12 and 13 as output (control) and Pins 19 and 23 as input (alarm) leads. When enabled, Pins 12 and 13 output +12V when ON and –12V when Off. Pins 19 and 23 recognize voltages from +2.2V to +12V as ON (reported as an external alarm) and –12V to +.8V as Off.

Rate — Select if a TDM/Flex is installed, so that Pin 12 on each port can be used to control speed selection and cause an extended modem to change speed to match the backup port speed.

RPowr — Select only when a redundant power supply is installed in the COMSPHERE® 3000 Series Carrier. This selection functions similarly to ExtLd.

CCN by EL: Disab
Next Enab Disab Prev

Configuration Change Notification by External Leads (only displayed when Full Mode is enabled). Controls the use of the general-purpose output leads to set a CCN event. *Ext Leads* must be set to ExtLd.

Enab — Select if a change in state of a general-purpose lead signals CCN to the NMS.

Disab — Select if changes to the lead state do not set a CCN event.

Table 5-8
(4 of 4)
General Configuration Options

DTR Alarm: Disab
Next Enab Disab Prev

Data Terminal Ready Alarm (only displayed when Full Mode is enabled, and a TDM/Flex is not installed). Causes the DSU to generate an alarm if DTR is Off for more than 30 seconds. The DCP displays *DTR Alarm* and reports the alarm to the NMS.

Enab — Select if the DSU should generate an alarm when DTR is turned Off for 30 seconds.

Disab — Select if the DTR lead is to be ignored.

Async→Sync: Disab
Next Enab Disab Prev

Asynchronous-to-Synchronous Conversion (only displayed with no TDM/Flex installed). Sets Port 1 of the DSU for asynchronous or synchronous operation.

Enab — Select to configure the DSU as asynchronous. An asynchronous-to-synchronous conversion takes place.

Disab — Select to configure the DSU as synchronous.

AsyncBit/Char: 8
Next 6 7 8 9 10 Prev

Asynchronous Bits per Character (only displayed with no TDM/Flex installed). Specifies the length of a character, including the parity bit but excluding the start and stop bits. This configuration option only applies when *Async→Sync* is enabled.

6 to 10 — Select the number of asynchronous bits per character. When *Stop Bits* is set to 2, 10 will not be displayed.

Stop Bits: 1
Next 1 2 Prev

Stop Bits (only displayed with no TDM/Flex installed). Specifies the number of stop bits in an asynchronous character. This configuration option only applies when *Async→Sync* is enabled.

1 to 2 — Select the number of stop bits to be used. When the *AsyncBit/Char* configuration option is set to 10, 2 will not be displayed.

Overspeed: 2.3
Next 1.0 2.3 Prev

Overspeed (only displayed with no TDM/Flex installed). Selects the overspeed range of the asynchronous-to-synchronous converter. This configuration option only applies when *Async→Sync* is enabled.

1.0 — Select the basic overspeed range. *Basic range* provides 1.0% overspeed in the DTE asynchronous data rate.

2.3 — Select the overspeed percentage for extended range. *Extended range* provides 2.3% overspeed in the DTE asynchronous data rate.

Table 5-9
(1 of 2)
Backup Configuration Options

Auto Bckup:Disab
Next Enab Disab Prev

Automatic Backup (only displayed when a DBM is installed, or an external DBU is configured to originate backup). Controls automatic initiation of a call setup attempt to a remote DBM or modem when there is a failure of the DDS network. (Automatic dial attempts begin after the Network Time-out expires.)

Enab — Select to initiate backup when there is a failure of the DDS network. The DSU waits for a period equal to DDS Time-out, and if the DDS network is still down, it attempts to establish a dial backup connection to the remote DBM.

Disab — Select so that no automatic dial backup connections are attempted.

Backup Dir: 1
Next Chang Prev

Backup Directory (only displayed when a DBM is installed). The DBM can store 10 telephone numbers or dial strings, identified by the numbers 1 through 10. Selecting the Backup Directory identifier displays the telephone number stored in that directory.

Chang — Select to enter or change the telephone number that is displayed.

FacAlOnCMI:Disab
Next Enab Disab Prev

Facility Alarm on Control Mode Idle (only displayed when Full Mode is enabled, when a DBM is installed, or an *external* DBU is configured to originate backup). Determines whether the DSU treats a control mode idle (CMI) condition as a facility alarm to trigger automatic dial backup. Configuration option *Auto Bckup* must be enabled, and *RTS Cntrl* set to FrcOn.

Enab — Select if the DSU should try and attempt to establish a dial backup connection to a remote DSU after the Network Time-out.

Disab — Select if a dial backup connection should not be attempted when CMI is detected.

AutoRestor:Disab
Next Enab Disab Prev

Automatic Restoration. Controls whether the DSU automatically terminates the dial backup call when the DDS circuit has returned to service.

On point-to-point circuits, a Digital Test is run to verify the DDS network. If the Digital Test is successful, user data is switched back to the DDS circuit.

For a multipoint network with dedicated multipoint dial backup, each tributary may be configured for *Auto Restor*, but will not occur unless backup was initiated by the tributary. The DDS network is not verified before data is switched back to the DDS network.

Enab — Select if restoral of the DDS circuit should trigger automatic restoration (after the Restoration Time-out expires).

Disab — Select if restoral of the DDS circuit is not to trigger automatic restoration.

NtwkTimOut: 0:20 for a control DSU; 01:00 for a tributary DSU
Next Chang Prev

Network Time-out (only displayed when Full Mode is enabled). Specifies the length of time the DDS network must remain out of service before the dial backup call attempt sequence is made. (*Auto Bckup* must be enabled.) *When configured for nondisruptive diagnostics, rate adaption, or if TDM/Flex is enabled, this configuration option must be set to greater than or equal to 20 seconds.*

Chang — Select to enter or change the current settings, which can range from 1 second to 30 minutes. The cursor has two positions: a minutes field with a range of 0 to 29, and a seconds field with a range of 00 to 59.

Table 5-9
(2 of 2)
Backup Configuration Options

RestorTimOut: 5m
Next Chang Prev

Restoration Time-out (only displayed when Full Mode is enabled). Specifies the length of time the DDS network must be back in service before automatic restoration is attempted. (*Auto Restor* must be enabled.)

Chang — Select to enter or change the current setting (range of 1 to 60 minutes).

TriesTimeOut:15m
Next Chang Prev

Call Attempts Time-out (only displayed when Full Mode is enabled). Sets an overall time limit for dial backup call attempts when the DDS network fails. *Auto Bckup* must be enabled, regardless of whether *MultiCall* is enabled (multiple calling cycle) or disabled (normal calling cycle).

Only 10 call attempts are made for the normal calling cycle. If a call attempt is in progress and the timer expires, the call attempt will *not* be aborted.

Chang — Select to enter or change the current setting (range of 1 to 60 minutes).

MultiCall:Disab
Next Enab Disab Prev

Multiple Calls (only displayed when Full Mode is enabled and a DBM is installed). Used primarily for multipoint dial backup, this configuration option selects the multiple calling cycle in which the DBM steps through the Backup Directory, attempting to call each valid telephone number in the directory, or selects the normal calling cycle. This configuration option only has an effect if *Auto Bckup* is set to Enab.

Enab — Select if the multiple calling cycle is to be used. The DBM makes one attempt to call the telephone number in the specified Backup Directory (default is the first telephone number in the directory). If the attempt fails, the DBM makes an attempt to call the next telephone number in the specified directory, and so on until either a call is completed or the DBM cycles through all the telephone numbers in the Backup Directory, ignoring blank entries. The DBM then waits five minutes and begins the calling cycle again until the *TriesTimeOut* period expires.

Disab — Select if the normal calling cycle is to be used: three call attempts, a 5-minute wait, three more call attempts, another 5-minute wait, etc., until the *TriesTimeOut* period expires.

NOTE: Multicall must not be enabled unless successive telephone numbers in the Backup Directory are different. In addition, duplicate telephone numbers should be avoided. These precautions prevent the DBM from making excessive call attempts to the same telephone number.

Table 5-10
MUX (Setup) Configuration Options

MUX Funct: Disab for MPTC; Enab for all other configurations Next Enab Disab Prev *TDM/Flex Function*. Enables or disables the TDM/Flex. Enab — Select when you want to enable the TDM/Flex and perform multiplexing. Disab — Select when you want to disable the TDM/Flex.
Share DevA: Enab for MPTT; Disab for all other configurations Next Enab Disab Prev *Sharing Device A*. Enabling this configuration option allows you to create a digital-sharing group. The following rules apply: • All ports in a group must have the same port speed. • All ports must be adjacent. • A digital-sharing group can have 2 ports. Enab — Select to enable the digital-sharing feature. Disab — Select to disable the digital-sharing feature.
Port Cntrl: DSD for MPTT; Host for all other configurations Next Host DSD Prev *Port Control*. Specifies how to handle contention between the ports in a digital-sharing group. Host — Select if the Host protocol must enforce the order of transmission to avoid collisions. DSD — Select for Digital-Sharing Device if selection of the next port to transmit is based upon the lowest-numbered port that is ready to transmit.

Table 5-11
(1 of 4)
MUX (Port) Configuration Options*

DTE Port: EIA232 Next EIA232 V.35 Prev *DTE Port*. Selects the port data will be transmitted over. EIA232 — Select when using the EIA-232 interface/connector. V.35 — Select when using the V.35 interface/connector (a V.35 adapter must be used on Port 2).
Async→Sync: Disab Next Enab Disab Prev *Asynchronous-to-Synchronous Conversion*. Sets the port for asynchronous or synchronous operation. **Option Verification**: When the TDM/Flex is enabled, the DSU verifies that the sum of the port speeds equals the aggregate speed. The asynchronous setting *cannot* be specified as underspeed. Enab — Select to configure the port as asynchronous (asynchronous-to-synchronous conversion takes place). Disab — Select to configure the port as synchronous.

* The menu paths for Prt1 and Prt2 are identical.

Table 5-11
(2 of 4)
MUX (Port) Configuration Options*

Async Rate: =Sync
Next =Sync 1800 1200 600 300 150 Prev

Asynchronous Rate. Specifies the rate of an asynchronous port. The asynchronous rate must be *less than* or *equal to* the synchronous data rate of the port. Set the synchronous data rate for a port via the Port Speed (PrtSp) configuration submenu. This configuration option is displayed only if *Async→Sync* is enabled.

Option Verification: When 1800 bps is selected, the DSU verifies that the synchronous port speed is 2400 bps or greater. If only one stop bit is used, the asynchronous rate *cannot* be equal to half the synchronous rate.

=Sync — Select for the asynchronous rate to be the same as the synchronous rate.

1800 to 150 — Select the rate of the asynchronous port.

AsyncBit/Char: 8
Next 6 7 8 9 10 Prev

Asynchronous Bits per Character. Specifies the length of a character, including the parity bit but excluding the start and stop bits. This configuration option is displayed only if *Async→Sync* is enabled. If set to 10, the *Stop Bits* configuration option only displays 1.

6 to 10 — Select the asynchronous bits per character.

Stop Bits: 1
Next 1 2 Prev

Stop Bits. Specifies the number of stop bits in an asynchronous character. This configuration option is displayed only if the *Async→Sync* configuration option is enabled and *AsyncBit/Char* is set to 6, 7, 8, or 9. If *AsyncBit/Char* is set to 10, only 1 stop bit appears.

1 to 2 — Select the number of stop bits to be used.

Overspeed: 2.5
Next 1.25 2.5 Prev

Overspeed. Selects the overspeed range of the asynchronous-to-synchronous converter. This configuration option only applies when *Async→Sync* is enabled.

1.25 — Select the basic overspeed range. *Basic range* provides 1.25% overspeed in the DTE asynchronous data rate.

2.5 — Select the overspeed percentage for extended range. *Extended range* provides 2.5% overspeed in the DTE asynchronous data rate.

RTS Cntrl: DTE
Next FrcOn DTE Prev

Request-to-Send Control. Controls the behavior of the internal RTS lead.

FrcOn — Select for the DSU to keep the internal RTS ON continuously. Any data appearing on the transmitted data (TXD) lead from the DTE is transmitted immediately.

DTE — Select for the DSU to turn ON RTS when the external RTS is turned ON. CTS is turned ON or Off by the external control signal RTS.

* The menu paths for Prt1 and Prt2 are identical.

Table 5-11
(3 of 4)
MUX (Port) Configuration Options*

TxCarrSel: Const
Next Const Cntrl Prev

Transmitter Carrier Select (only displayed when Full Mode is enabled). Enables the TDM/Flex transmitter circuitry to simulate switched-carrier operation (using the V.13 codes) on an individual channel. Simulated switched-carrier operation is also referred to as pseudo-controlled carrier (PCC) mode. It is required for applications where the receiving DTE expects a raised LSD lead prior to receiving data.

NOTE: A port may be configured for switched-carrier operation in one direction and constant-carrier operation in the other.

Const — Select (constant-carrier operation) if the V.13 codes are not to be sent. The corresponding remote TDM/Flex port must be configured for Receiver Constant Carrier or Mark (*RxCarrSel* set to Const or Mark). Configure each port in a digital-sharing group for Constant Carrier operation (*TxCarrSel* set to Const).

Cntrl — Select Controlled or switched-carrier operation (PCC mode) if the DSU is to transmit the V.13 codes over the DDS line when the port RTS changes state. When RTS is turned ON, the DSU transmits a code that turns ON LSD at the remote TDM/Flex port before CTS is turned ON at the local port. When RTS is dropped, the DSU sends a code that turns Off LSD at the remote TDM/Flex port. The corresponding remote TDM/Flex port must be configured for Receiver Controlled Carrier (*RxCarrSel* set to Cntrl). This selection is not valid if the DSU is part of a Digital-Sharing Device (DSD) group. (See the Mark selection in the configuration option Receiver Carrier Select.)

RxCarrSel: Const
Next Const Cntrl Mark Prev

Receiver Carrier Select (only displayed when Full Mode is enabled). Enables the TDM/Flex receiver circuitry to simulate switched-carrier operation (using the V.13 codes) on an individual circuit.

NOTE: Configuration values Const and Cntrl for Receiver Carrier Select are both valid choices for a port belonging to a digital-sharing group.

Const — Select Constant-carrier operation if the receiving DSU is not to look for V.13 codes used by the V.13 protocol, and is not to toggle LSD.

Cntrl — Select Controlled or switched-carrier operation (PCC mode) if the receiving DSU is to look for V.13 codes used by the V.13 protocol indicating the transition of RTS at the remote TDM/Flex port; the receiving DSU toggles LSD as appropriate.

Mark — Select if 30 consecutive Marks are received and received Line Signal Detect (LSD) goes Off at the port. Received LSD goes ON again just before the first space. (*TxCarrSel* must be set to Const at the remote unit.) *This setting is used primarily when the remote DSU has a DSD group.*

PCC Buffer: Disab
Next Enab Disab Prev

Pseudo-Controlled Carrier Buffer (only displayed when Full Mode is enabled). Intercepts the V.13 codes used by the V.13 protocol so they do not pass to the receiving DTE. This configuration option is only valid when *RxCarrSel* is set to Cntrl.

For an asynchronous port configured for switched-carrier operation, set *PCC Buffer* to Enab.

For a synchronous port configured for switched-carrier operation, *PCC Buffer* can be disabled or enabled, depending on whether the V.13 codes disrupt communication at the receiving DTE. *Be aware that enabling this configuration option can corrupt the end-of-message for some synchronous protocols.*

Enab — Select to enable the PCC Buffer feature.

Disab — Select to disable the PCC Buffer feature.

* The menu paths for Prt1 and Prt2 are identical.

Table 5-11
(4 of 4)
MUX (Port) Configuration Options*

Elast Stor: Disab Next Enab Disab Prev *Elastic Store* (only displayed when Full Mode is enabled). Elastic Store hardware consists of a transmit buffer (register). Serial data from the extended circuit is clocked into the DSU elastic store using a clock provided by the extended circuit received clock lead. The DSU uses its own system timing to clock data out of the buffer. Elastic Store is reset on power-up, overflow, or after the RTS lead makes an Off-to-ON transition. After reset, the elastic store can drift by ±5 bits with the TDM/Flex enabled before overflow occurs. Enab — Select to enable this configuration option. Disab — Select to disable this configuration option.
RTS/CTS Del: 0 Next Chang Prev *Request-To-Send to Clear-To-Send Delay* (only displayed when Full Mode is enabled). Allows for an additional delay between the time that RTS is turned ON and CTS is turned ON. An additional delay is sometimes required for multiplexed applications operating in switched-carrier operation. *Enough delay must be provided so that the last DSU in the circuit has time to train and is ready to accept data before CTS is turned ON.* Chang — Select to change the RTS-to-CTS delay, from 0 to 1040 milliseconds in 8 milliseconds increments.
DTR Alarm: Disab Next Enab Disab Prev *Data Terminal Ready Alarm* (only displayed when Full Mode is enabled). Causes the DSU to report an alarm for the port if the port's DTR lead is Off for more than 30 seconds. The DCP displays DTR Alarm and reports the alarm to NMS. Enab — Select if you want the DSU to report an alarm when the port's DTR lead turns Off for 30 seconds. Disab — Select if no alarm is to be reported, regardless how long the port's DTR lead is Off.
AntiStream:Disab Next Chang Prev *Antistreaming* (only displayed when Full Mode is enabled). Antistreaming provides circuit protection against a streaming DTE (a defective DTE that has its RTS lead constantly turned ON) by clamping the RTS lead of the tributary DSU. Antistreaming only takes effect when *RTS Cntrl* is set to DTE; it is disabled when *RTS Cntrl* is set to FrcOn. Chang — Set timer to any value from 1 to 100 second(s), in increments of 1; or to *Disab* when streaming terminal detection is not needed.
DSR FrcOn: Enab Next Enab Disab Prev *Data Set Ready Forced On* (only displayed when Full Mode is enabled). Provides the ability to override any other options controlling the DSR lead. Enab — Select for DSR to remain ON as long as the device is working, regardless of any tests or network alarms. Disab — Select if DSR is to function as an active lead, reflecting various test and alarm conditions.
DSR on Tst: Enab Next Enab Disab Prev *Data Set Ready On in Test* (only displayed when Full Mode is enabled). Controls the behavior of the DSR lead during testing. Enab — DSR is ON continuously during testing, allowing a DTE that relies on DSR being ON to send test messages to the DSU. Disab — DSR is Off during testing.

* The menu paths for Prt1 and Prt2 are identical.

Table 5-12
Port Speed (DSU) Configuration Options

Prt1(9.6): 9.6
Next 64 56 48 19.2 9.6 4.8 2.4 1.2 Disab Prev

Port 1 Speed. Primary data rate in kbps on Port 1. (Must be set to the same value in the remote DSU.)

64 to 1.2 kbps — Select to set the port's operating rate.

Disab — Select to disable the port.

Option Verification: For all ports, the DSU verifies that the sum of the individual port speeds does not exceed the primary aggregate speed set in *Rate(Kbps)* in the DSU option set. If the sum of the port speeds *equals* the primary aggregate rate, *an underspeed port selection is required*.

Prt2(9.6): 9.6
Next 64 56 48 19.2 9.6 4.8 2.4 1.2 Disab Prev

Port 2 Speed. Primary data rate in kbps on Port 2. (Must be set to the same value in the remote DSU.)

64 to 1.2 kbps — Select to set the port's operating rate.

Disab — Select to disable the port.

Option Verification: For all ports, the DSU verifies that the sum of the individual port speeds does not exceed the primary aggregate speed set in *Rate(Kbps)* in the DSU option set. If the sum of the port speeds *equals* the primary aggregate rate, *an underspeed port selection is required*.

Underspeed: Disab
Next Disab Prt1 Prt2 Prev

Underspeed Port. Selects which port is to run slightly underspeed to allow for in-band framing and in-band secondary channel transport, if used. If more than one port is active and the sum of the port speeds equals the primary aggregate speed, *then one synchronous port must run underspeed*.

The number of bits per second used for in-band framing is 10. The in-band secondary channel transport speed is set in *2nd Chan(bps)* and, if used, includes the 10 bps in-band framing. A port used for asynchronous operation may not be set for underspeed.

NOTE: When *Port Cntrl* is set to DSD or *Share DevA* is enabled (in the MUX (Setup) option set), port speeds are only counted once per DSD when calculating used bandwidth.

Disab — No port runs underspeed during primary operation.

Prt1 or Prt2 — Selected port runs underspeed during primary operation.

Table 5-13
Port Speed (DBM) Configuration Options

Prt1(9.6): 9.6
Next 14.4 56 12.0 9.6 4.8 2.4 1.2 Disab Prev

Port 1 Speed. Primary data rate in kbps on Port 1. (Must be set to the same value in the remote DBM.)

14.4 to 1.2 kbps — Select to set the port's operating rate.

Disab — Select to disable the port.

Option Verification: For all ports, the DBM verifies that the sum of the individual port speeds does not exceed the primary aggregate speed set in *Rate(Kbps)* in the DBM option set. If the sum of the port speeds *equals* the primary aggregate rate, *an underspeed port selection is required*.

Prt2(9.6): 9.6 for MPTT; Disab for all other configurations
Next 14.4 12.0 19.2 9.6 4.8 2.4 1.2 Disab Prev

Port 2 Speed. Primary data rate in kbps on Port 2. (Must be set to the same value in the remote DBM.)

14.4 to 1.2 kbps — Select to set the port's operating rate.

Disab — Select to disable the port.

Option Verification: For all ports, the DSU verifies that the sum of the individual port speeds does not exceed the primary aggregate speed set in *Rate(Kbps)* in the DBM option set. If the sum of the port speeds *equals* the primary aggregate rate, *an underspeed port selection is required.*

Underspeed: Disab
Next Disab Prt1 Prt2 Prev

Underspeed Port. Selects which port is to run slightly underspeed to allow for in-band framing and in-band secondary channel transport, if used. If more than one port is active and the sum of the port speeds equals the primary aggregate speed, *then one synchronous port must run underspeed*.

The number of bits per second used for in-band framing is 10. The in-band secondary channel transport speed is set in *2nd Chan(bps)* and, if used, includes the 10 bps in-band framing. A port used for asynchronous operation may not be set for underspeed.

NOTE: When *Port Cntrl* is set to DSD or *Share DevA* is enabled (in the MUX (Setup) option set), port speeds are only counted once per DSD when calculating used bandwidth.

Disab — No port runs underspeed during primary operation.

Prt1 or Prt2 — Selected port runs underspeed during primary operation.

Table 5-14
Port Speed (External DBU) Configuration Options

Prt1(9.6): 9.6
Next 64 56 48 28.8 19.2 14.4 9.6 4.8 2.4 1.2 Disab Prev

Port 1 Speed. Primary data rate in kbps on Port 1. (Must be set to the same value in the *external* DBU.)

64 to 1.2 kbps — Select to set the port's operating rate.

Disab — Select to disable the port.

Option Verification: For all ports, the DSU verifies that the sum of the individual port speeds does not exceed the primary aggregate speed set in the *external* DBU's *Rate(Kbps)* configuration option. If the sum of the port speeds equals the primary aggregate rate, *an underspeed port selection is required*.

Prt2(9.6): 9.6
Next 64 56 48 28.8 19.2 14.4 9.6 4.8 2.4 1.2 Disab Prev

Port 2 Speed. Primary data rate in kbps on Port 2. (Must be set to the same value in the *external* DBU.)

64 to 1.2 kbps — Select to set the port's operating rate.

Disab — Select to disable the port.

Option Verification: For all ports, the DSU verifies that the sum of the individual port speeds does not exceed the primary aggregate speed set in the *external* DBU's *Rate(Kbps)* configuration option. If the sum of the port speeds equals the primary aggregate rate, *an underspeed port selection is required.*

Underspeed: Disab
Next Disab Prt1 Prt2 Prev

Underspeed Port. Selects which port is to run slightly underspeed to allow for in-band framing and in-band secondary channel transport, if used. If more than one port is active and the sum of the port speeds equals the primary aggregate speed, *then one synchronous port must run underspeed*.

The number of bits per second used for in-band framing is 10. The in-band secondary channel transport speed is set in *2nd Chan(bps)* and, if used, includes the 10 bps in-band framing. A port used for asynchronous operation may not be set for underspeed.

NOTE: When *Port Cntrl* is set to DSD or *Share DevA* is enabled (in the *MUX (Setup)* option set), port speeds are only counted once per DSD when calculating used bandwidth.

Disab — Select if no port is to run underspeed during primary operation.

Prt1 or Prt2 — Select the port to run underspeed during primary operation.

DSU Menu A

Overview A-1
Menu Structure A-1
Top-Level Menu A-1
Local/Remote Menu Subbranches A-4

Overview

This menu is your map through the DSU's various functions and pathways. Compare it against the menus that appear as you move through procedures. You will learn to quickly access where you want to go on the menu when operating the DSU.

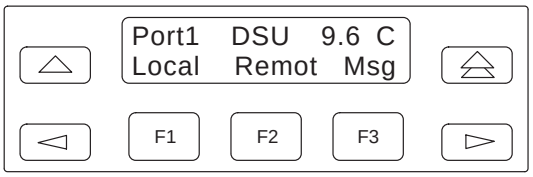
Menu Structure

The DSU's operation is represented as menu selections that branch downward from its starting point, the top-level menu, like the roots of a tree. The menu is sometimes referred to as a *menu tree*.

Top-Level Menu

The top-level menu is the starting point for all DSU operations. You can always return to this point from anywhere in the menu by pressing the ⏏ key. *Pressing this key immediately terminates any operation or work in progress.*

The following shows an example of the top-level menu for a standalone Model 3550 DSU that is configured as a control operating at 9.6 kbps, with an NMS message waiting.



The following information is displayed:

Line 1 – Source of the information being displayed

– DSU's current function or mode (In this example, the unit is operating as a DSU, not as a DBM or TDM/Flex.)

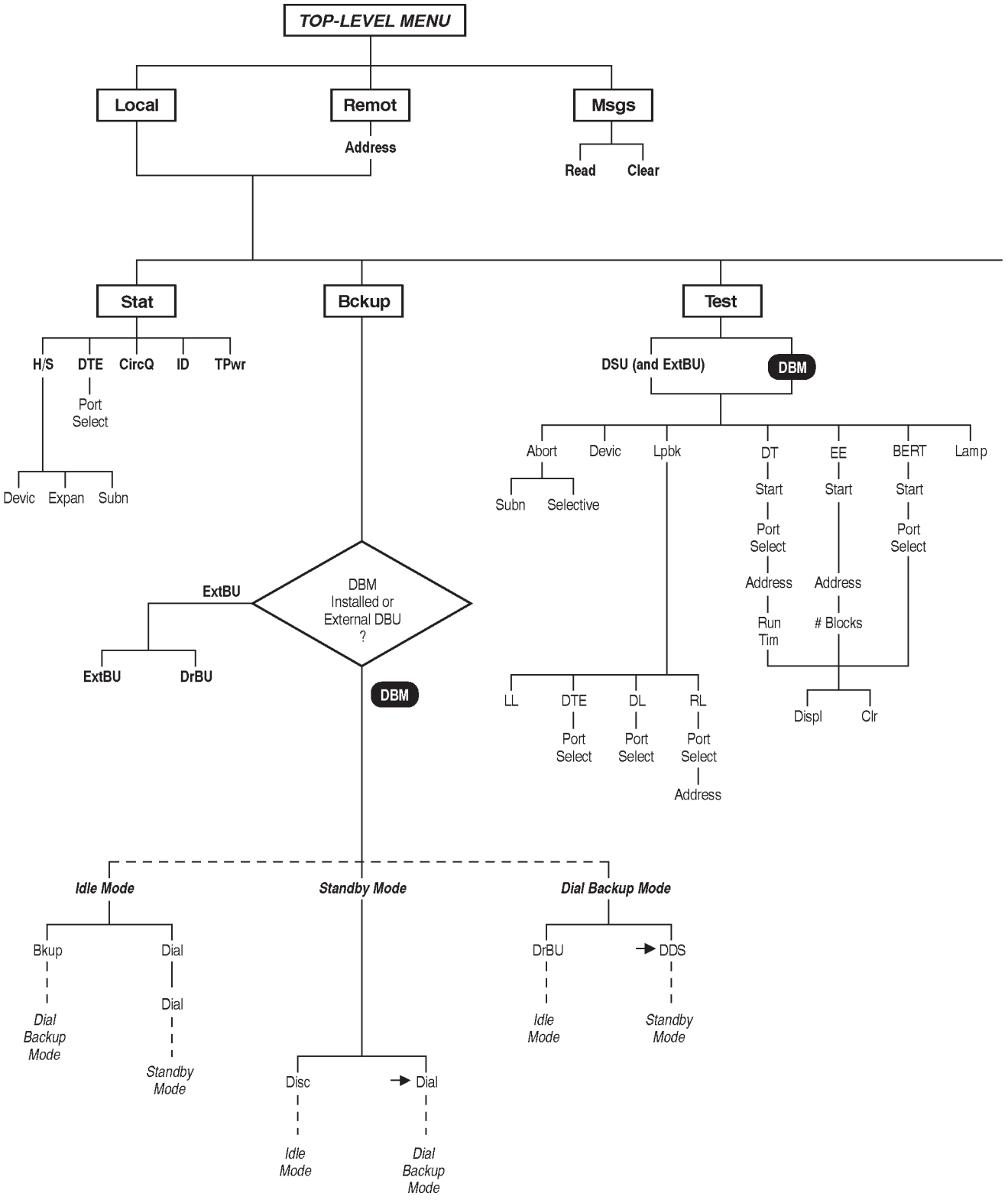
– DSU's data rate

– DSU's network designation (Here the DSU is a control.)

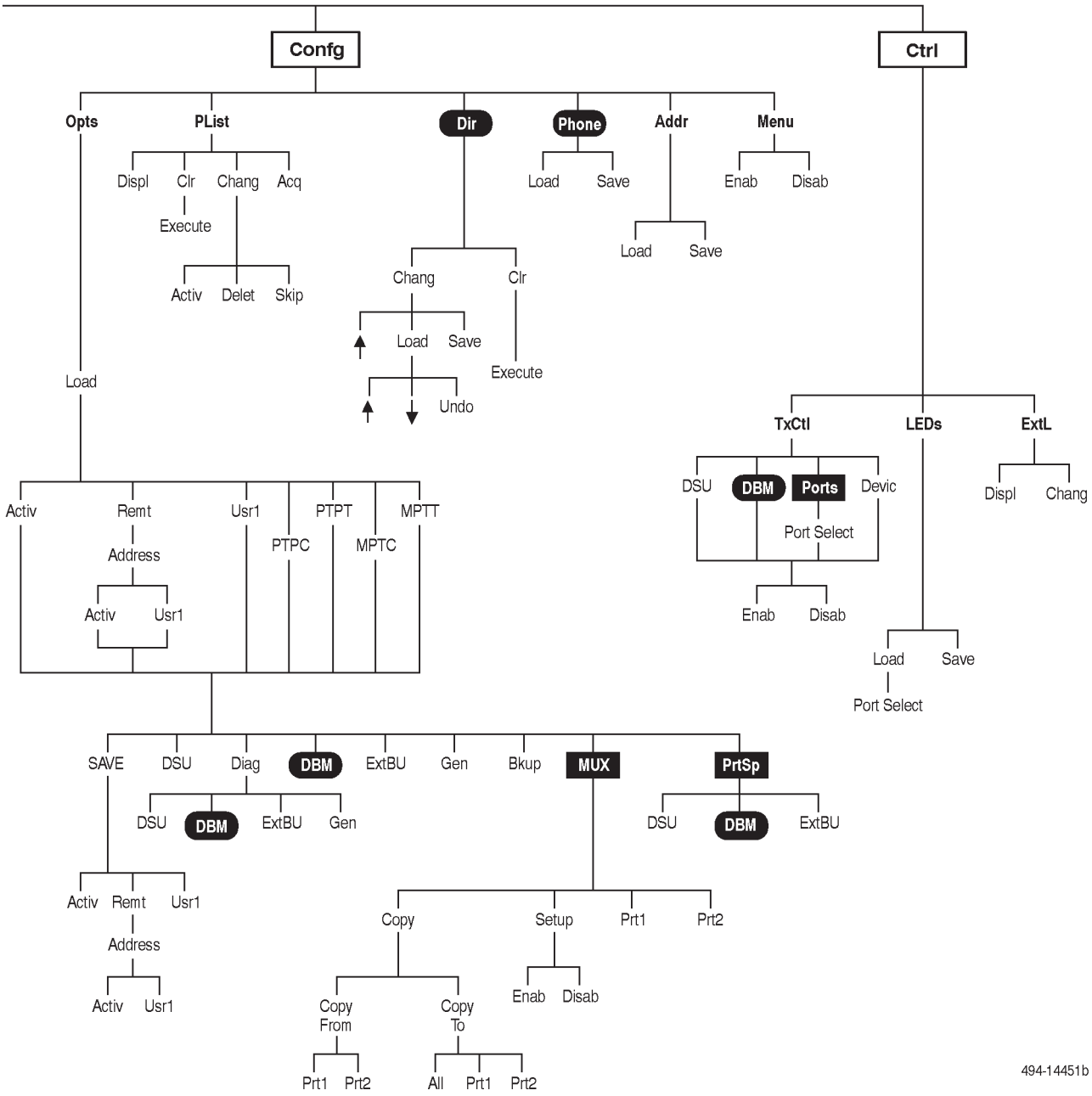
If this display was for a Model 3551 (a carrier-mounted DSU), the carrier (nest or rack) and slot numbers would appear instead of *Port 1* (e.g., Carrier 2 and Slot 16 would appear as 2:16).

Line 2 – Menu selections, one appearing directly over each function key (F1 and F2).

Continued on Page A-4.


TOP-LEVEL MENU
Local
Remot
Address
Msgs
Read
Clear
Stat
H/S
DTE
Port Select
CircQ
ID
TPwr
Devic
Expan
Subn
Bckup
ExtBU
DBM Installed or External DBU ?
ExtBU
DrBU
DBM
Test
DSU (and ExtBU)
DBM
Abort
Devic
Lpbk
DT
EE
BERT
Lamp
Subn
Selective
Start
Port Select
Address
Run Tim
Start
Address
Blocks
Start
Port Select
Displ
Clr
LL
DTE
DL
RL
Port Select
Port Select
Port Select
Address
Idle Mode
Standby Mode
Dial Backup Mode
Bkup
Dial
Dial Backup Mode
Dial
Standby Mode
Disc
Dial
Idle Mode
Dial Backup Mode
DrBU
DDS
Idle Mode
Standby Mode
494-14451a

ABBREVIATIONS									
→ DDS	Switch to DDS Path	Diag	Diagnostic	H/S	Device Health/Status	PTPC	Point-to-Point Control
→ Dial	Switch to Dial Path	Dir	Directory	ID	Identity	PTPT	Point-to-Point Tributary
Acq	Acquire	Disc	Disconnect	LEDs	Monitor Port	Remot	Remote Mode
Bckup	Backup	DL	Digital Loopback	LL	Local Loopback	RL	Remote Loopback
BERT	Bit Error Rate Test	DrBU	Drop Backup	Lpbk	Loopback	Stat	Status
CircQ	Circuit Quality	Dspl	Display	MPTC	Multipoint Control	TPwr	Terminal Power
Clr	Clear	DT	Digital Test	MPTT	Multipoint Tributary	TxCtl	Transmitter Control
Confg	Configure	DTE	DTE Loopback	Msgs	Messages		
Ctrl	Control	EE	End-to-End Test	Opts	Configuration Options	XXX	for TDM/Flex
Devic	Device Test	ExtBU	External Dial Backup Unit	PList	Poll List	XXX	for DBM
		ExtL	External Leads	PrtSp	Port Speed		



Continued from Page A-1.

Press a function key to select one of the following branches:

- **Local** branch
- **Remote** branch – Only available to a DSU configured as a control or a point-to-point tributary.
- **Messages** branch – Only appears when a message from the NMS is waiting. Once the message is cleared, this branch no longer appears.

Local/Remote Menu Subbranches

The **Local** branch menu has *five* subbranches; the **Remote** branch menu has *four*:

- The **Status** (Stat) branch provides reports on the health and status of the DSU and DBM, the DTE interface, the identity of the DSU and DBM, the status of the connected DTE's EIA-232 and V.35 interfaces, and if there is a dialed connection, the quality of the dial network circuit. *If a TDM/Flex is installed*, its status is integrated into the DSU's status.
- The **Backup** (Bckup) branch controls the operation of the dial backup feature. This branch is available if a DBM or an *external* dial backup unit (DBU) is installed. Only available from the Local branch.
- The **Test** branch provides extensive testing capabilities for the DSU; the DDS circuit; the DBM, if installed; and the backup circuit, if there is a backup call established. *If a TDM/Flex is installed*, testing is available on a per port basis.

NOTE

If the **Test** branch does not appear, the DSU is in Display mode (values can be read, but not changed).

Only authorized persons can change configuration option values for the DSU. Contact your System Administrator for further information.

- The **Configuration** (Confg) branch provides the ability to customize DSU software configuration options, to enter and change telephone numbers (if a DBM is installed), to change the DSU network address, and to specify the menu mode for displaying configuration options of the unit.
- The **Control** (Ctrl) branch provides the ability to display and change external leads and enable or disable the DSU or a DBM or TDM/Flex, when installed. *When a TDM/Flex is installed*, the circuit designation status indicators (TXD, RXD, etc.) reflect the status of a selected port.

Each selection leads to a functional subbranch of the menu.

Only three menu selections appear at a time, one over each function (F1, F2, F3) key. Press the ◁ and ▷ keys to scroll backward or forward through menu selections.

- Press the △ key to go to the previous screen/menu display.
- Press the ⏢ key to return to the starting point – the top-level menu.

Refer to Chapters 4 and 5 for additional DCP operation information.

Configuration Worksheets B

Overview B-1
Instructions B-1

Overview

Configuration Worksheets summarize the DSU's software configuration options and the selections that can be set for each. The Configuration Option Tables in Chapter 5 provide further explanation of each configuration option should you need to change settings, as well as an example showing how to change or edit these options.

This appendix contains two Configuration Worksheets (two pages each). These worksheets include the following:

- Configuration options as they appear when **Menu** *Full Mode* is enabled.
- Configuration options as they appear when **Menu** *Full Mode* is disabled.

Refer to the *Configuration Option Tables* section, Chapter 5, when configuring the unit, or when more detailed configuration information is needed.

Instructions

Configuration Worksheets can be used for reference, or they can be used to record changes made to the DSU's configuration options or to record the configurations saved to the Usr1 storage area.

1. Select the worksheet version you will be editing (Full Mode: Enab *or* Disab), and make a copy.
2. Complete the information at the top of each worksheet first.

   If you have a Model 3550 (standalone) DSU, enter your site in the location field

   If you have a Model 3551 (carrier-mounted) DSU, enter the DSU's carrier and slot location. Also, make a copy for each DSU.
3. Circle the appropriate setting(s) – either all of the configuration option changes, or only those changed from their factory-loaded (default) settings.
4. Store the worksheets so they will be available when needed.

Model 3550 or 3551 DSU Configuration Worksheet (1 of 2)

(Full Menu Mode: Enabled)

Date:_____ Location:_____ Local Phone No: ( ) _____

Device:_____ Local Addr:_____ ☐ DBM Installed

Serial No:_____ Tributary Network Addr:_____ ☐ TDM/Flex Installed

Menu	Value
Full Mode	**Enab**, Disab

DSU	Value
Rate(Kbps)	64L, 56, 38.4, 19.2, 9.6, 4.8, 2.4
PrtSp(Kbps)	64, 56, 48, 19.2, 9.6, 4.8, 2.4, 1.2, Disab
TxClkSource	Int, Ext, Prt1, Prt2, DDS
Msg Clamp	Enab, Disab
TxElasStor	Enab, Disab
RxElasStor	Enab, Disab
19.2 PowrLvl	+ 6, 0, –10
V.54 Lpbk	Enab, Disab

Diagnostic (DSU)	Value
Diag Type	NonD, Disr, Mixed, None
2nd Ch(bps)	100, 400, 800, 1200, 1600

Diagnostic (DBM)	Value
Diag Type	NonD, Disr, Mixed, None
2nd Ch(bps)	100, 400, 800, 1200, 1600

Diagnostic (External DBU)	Value
Diag Type	Disr, None

Diagnostic (General)	Value
Position	Cntrl, Trib
LinkConfig	Pt-Pt, M-Pt
Resp Period	1, 2, 10
Trib Tim Out *(Chang)*	min sec (5 sec to 10 min)
Link Delay	0s, 1s, 2s, 5s, 10s, 20s, 50s
Packet Delay	0s, 1s, 2s, 5s
M-Pt SymPrt	Enab, Disab

DBM	Value
Rate(Kbps)	14.4, 12.0, 9.6, 4.8, 2.4
PrtSp(Kbps)	14.4, 12.0, 9.6, 4.8, 1.2, Disab
TxClkSource	Int, RXC, Ext, Prt1, Prt2, DSU
CarrLossDisc	Yes, No
Auto Retrain	Yes, No
Single Rate	Yes, No
AutoAnswer	Enab, Disab
TxElasStor	Enab, Disab
RxElasStor	Enab, Disab
Call Setup	None, Pswrd, Cllbk, Alarm
RxPwd *(Chang)*	(up to 10 digits)
TxPwd *(Chang)*	(up to 10 digits)
V.13 Signl	Enab, Disab
Dial Test	Enab, Disab
DTRCallCon	Ansr, Disab

External DBU	Value
ExtBU	Ansr, Orig, None
Rate(Kbps)	64, 56, 38.4, 28.8, 19.2, 14.4, 9.6, 4.8, 2.4
TxClkSource	DCE, Prt1, Prt2

General	Value
DTE Port	EIA232, V.35
RTS Cntrl	FrcOn, DTE
CTS Cntrl	Std, =RTS, Delay, FrcOn
AntiStream *(Chang)*	Disab (1 to 100 sec)
LSD Lead	STD, Delay, FrcOn
DSR FrcOn	Enab, Disab
SystemStat	Enab, Disab
DSR on Tst	Enab, Disab
Circ Assur	Enab, Disab
RespondRDL	Enab, Disab
LL by DTE	Enab, Disab
RL by DTE	Enab, Disab
Bilat Lpbk	Enab, Disab
Ext Leads	ExtLd, Rate, RPower
CCN by EL	Enab, Disab
DTR Alarm	Enab, Disab
Async→Sync	Enab, Disab
AsyncBit/Char	6, 7, 8, 9, 10
Stop Bits	1, 2
Overspeed	1.0, 2.3

Model 3550 or 3551 DSU Configuration Worksheet (2 of 2)

(Full Menu Mode: Enabled)

Backup	Value
Auto Bckup	Enab, Disab
Backup Dir *(Chang)*	(1–10)
FacAlOnCMI	Enab, Disab
AutoRestor	Enab, Disab
NtwkTimOut *(Chang)*	min and sec (1 to 30 min)
RestorTimOut *(Chang)*	min and sec (1 to 60 min)
TriesTimeOut *(Chang)*	min and sec (1 to 60 min)
MultiCall	Enab, Disab

Backup Directory (DBM only)	Dial String
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	

MUX (Setup)	Value
MUX Funct	Enab, Disab
Share DevA	Enab, Disab
Port Cntrl	Host, DSD

MUX (Port 1)	Value
DTE Port	EIA232, V.35
Async→Sync	Enab, Disab
Async Rate	=Sync, 1800, 1200, 600, 300, 150
AsyncBit/Char	6, 7, 8, 9, 10
Stop Bits	1, 2
Overspeed	1.25, 2.5
RTS Cntrl	FrcOn, DTE
TxCarrSel	Const, Cntrl
RxCarrSel	Const, Cntrl, Mark
PCC Buffer	Enab, Disab
Elast Stor	Enab, Disab
RTS/CTS Del *(Chang)*	(0 to 1040 millisec)
DTR Alarm	Enab, Disab
AntiStream *(Chang)*	(1 to 100 sec)
DSR FrcOn	Enab, Disab
DSR on Tst	Enab, Disab

Port Speed (DSU)	Value
Prt1 (xx.x)	64, 56, 48, 19.2, 9.6, 4.8, 2.4, 1.2, Disab
Prt2 (xx.x)	64, 56, 48, 19.2, 9.6, 4.8, 2.4, 1.2, Disab
Underspeed	Disab, Prt1, Prt2

Port Speed (DBM)	Value
Prt1 (xx.x)	14.4, 56, 12.0, 9.6, 4.8, 2.4, 1.2, Disab
Prt2 (xx.x)	14.4, 12.0, 19.2, 9.6, 4.8, 2.4, 1.2, Disab
Underspeed	Disab, Prt1, Prt2

Port Speed (External DBU)	Value
Prt1 (xx.x)	64, 56, 48, 28.8, 19.2, 14.4, 9.6, 4.8, 2.4, 1.2, Disab
Prt2 (xx.x)	64, 56, 48, 28.8, 19.2, 14.4, 9.6, 4.8, 2.4, 1.2, Disab
Underspeed	Disab, Prt1, Prt2

MUX (Port 2) Model 3550 Only	Value
DTE Port	EIA232, V.35
Async→Sync	Enab, Disab
Async Rate	=Sync, 1800, 1200, 600, 300, 150
AsyncBit/Char	6, 7, 8, 9, 10
Stop Bits	1, 2
Overspeed	1.25, 2.5
RTS Cntrl	FrcOn, DTE
TxCarrSel	Const, Cntrl
RxCarrSel	Const, Cntrl, Mark
PCC Buffer	Enab, Disab
Elast Stor	Enab, Disab
RTS/CTS Del *(Chang)*	(0 to 1040 millisec)
DTR Alarm	Enab, Disab
AntiStream *(Chang)*	(1 to 100 sec)
DSR FrcOn	Enab, Disab
DSR on Tst	Enab, Disab

Hardware Straps	Value
DDS Interface	Permissive, Programmable
Frame Ground/ Signal Ground	Connected, Disconnected
Test Mode indication	Enabled, Disabled

Model 3550 or 3551 DSU Configuration Worksheet (1 of 2)

(Full Menu Mode: Disabled)

Date:_____ Location:_____ Local Phone No: ( ) _____

Device:_____ Local Addr:_____ ☐ DBM Installed

Serial No:_____ Tributary Network Addr:_____ ☐ TDM/Flex Installed

Menu	Value
Full Mode	Enab, **Disab**

DSU	Value
Rate(Kbps)	64L, 56, 38.4, 19.2, 9.6, 4.8, 2.4
PrtSp(Kbps)	64, 56, 48, 19.,2, 9.6, 4.8, 2.4, 1.2, Disab
TxClkSource	Int, Ext, DDS, Prt1, Prt2

Diagnostic (DSU)	Value
Diag Type	NonD, Disr, Mixed, None

Diagnostic (DBM)	Value
Diag Type	NonD, Disr, Mixed, None

Diagnostic (External DBU)	Value
Diag Type	Disr, None

Diagnostic (General)	Value
Position	Cntrl, Trib
LinkConfig	Pt-Pt, M-Pt

External DBU	Value
ExtBU	Ansr, Orig, None
Rate(Kbps)	64, 56, 38.4, 28.8, 19.2, 14.4, 9.6, 4.8, 2.4
TxClkSource	DCE, Prt1, Prt2

General	Value
DTE Port	EIA232, V.35
RTS Cntrl	FrcOn, DTE
CTS Cntrl	Std, =RTS, Delay, FrcOn
Async→Sync	Enab, Disab
AsyncBit/Char	6, 7, 8, 9, 10
Stop Bits	1, 2
Overspeed	1.0, 2.3

DBM	Value
Rate(Kbps)	14.4, 12.0, 9.6, 4.8, 2.4
PrtSp(Kbps)	14.4, 12.0, 9.6, 4.8, 1.2, Disab
TxClkSource	Int, RXC, Ext, Prt1, Prt2, DSU

Backup	Value
Auto Bckup	Enab, Disab
Backup Dir *(Chang)*	(1–10)
AutoRestor	Enab, Disab

Backup Directory (DBM only)	Dial String
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	

Model 3550 or 3551 DSU Configuration Worksheet (2 of 2)

(Full Menu Mode: Disabled)

MUX (Setup)	Value
MUX Funct	Enab, Disab
Share DevA	Enab, Disab
Port Cntrl	Host, DSD

Hardware Straps	Value
DDS Interface	Permissive, Programmable
Frame Ground/ Signal Ground	Connected, Disconnected
Test Mode indication	Enalbed, Disabled

MUX (Port 1)	Value
DTE Port	EIA232, V.35
Async→Sync	Enab, Disab
Async Rate	=Sync, 1800, 1200, 600, 300, 150
AsyncBit/Char	6, 7, 8, 9, 10
Stop Bits	1, 2
Overspeed	1.25, 2.5
RTS Cntrl	FrcOn, DTE

Port Speed (DSU)	Value
Prt1 (xx.x)	64, 56, 48, 19.2, 9.6, 4.8, 2.4, 1.2, Disab
Prt2 (xx.x)	64, 56, 48, 19.2, 9.6, 4.8, 2.4, 1.2, Disab
Underspeed	Disab, Prt1, Prt2

Port Speed (DBM)	Value
Prt1 (xx.x)	14.4, 12.0, 9.6, 4.8, 2.4, 1.2, Disab
Prt2 (xx.x)	14.4, 12.0, 9.6, 4.8, 2.4, 1.2, Disab
Underspeed	Disab, Prt1, Prt2

Port Speed (External DBU)	Value
Prt1 (xx.x)	64, 56, 48, 28.8, 19.2, 14.4, 9.6, 4.8, 2.4, 1.2, Disab
Prt2 (xx.x)	64, 56, 48, 28.8, 19.2, 14.4, 9.6, 4.8, 2.4, 1.2, Disab
Underspeed	Disab, Prt1, Prt2

MUX (Port 2) Model 3550 Only	Value
DTE Port	EIA232, V.35
Async→Sync	Enab, Disab
Async Rate	=Sync, 1800, 1200, 600, 300, 150
AsyncBit/Char	6, 7, 8, 9, 10
Stop Bits	1, 2
Overspeed	1.25, 2.5
RTS Cntrl	FrcOn, DTE

Status Indicators and Control Panel Messages C

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Overview

This appendix describes the status indicators on the DSU's control panel, the Diagnostic Control Panel (DCP) for a Model 3550 and the Shared Diagnostic Control Panel (SDCP) for the Model 3551.

Informational messages that may appear on the control panel while a command is executing, or when a command is prevented from executing are also described.

Status Indicators

Status indicators provide information on the current operating condition of the DSU. The status indicators of the Model 3550 DSU appear on the DCP's faceplate. The status indicators for the carrier-mounted Model 3551 DSU are spread across the the faceplate of the DSU, the SDCP, and the faceplate of the shared diagnostic unit (SDU), if installed. Refer to the *COMSPHERE 3000 Series Carrier Installation Manual* for SDU status indicator information. The DSU DCP and SDCP status indicators are described in Tables C-1 and C-2.

Table C-1
DSU Status Indicators

Label	Color	Description
OK	Green	Health and status indicator: DSU operation is normal. (The DSU has not detected any of the faults listed under **Alrm,** below.) This indicator flashes two times per second if a message from the NMS is present.
Alrm	Red	Health and status indicator: There is a fault in the local or remote DSU, DBM, or DDS facility, or there is a corrupted configuration. The following alarms at the local or remote DSU cause the **Alrm** status indicator on the affected DSU to light: Configuration Corrupt Device Fault Dial Tone Test Failure DTR Alarm Facility Alarm MUX Failure No Response Redundant Power Alarm Streaming Terminal Subnetwork Alarm Out-of-Frame Threshold Out-of-Service
Test	Yellow	Active device (DSU or DBM) is either performing a test or other DSUs or DBMs are in Test mode.[1]
Dial	Yellow	DBM is active Rapid flashing: Call setup in progress Slow flashing: Call established but in Standby mode Steady ON: Backup call established and active
TXD, RXD, RTS, CTS, DSR, DTR, LSD	Green	Internal lead states at the DSU/DTE interface*(circuit designations)*: Control circuit active *or* Data circuit SPACE(ing).
Front Panel (Model 3551 only)	Yellow	DSU is currently selected at the SDCP. (*The SDCP addresses one DSU at a time.*)

[1] The DSU or DBM is automatically put into Test mode when a remote DSU or DBM is performing a disruptive test (e.g., a Local Loopback (LL) at the control DSU. A DSU or DBM in Test mode has its DTE interface turned Off).

Table C-2
SDCP Status Indicators

Label	Color	Description
OK	Green	Health and status indicator for the selected DSU; mirrors the **OK** indicator on the DSU faceplate.
Alrm	Red	Health and status indicator for the selected DSU; mirrors the **Alrm** indicator on the DSU faceplate.
BckUp	Yellow	Mirrors the **BckUp** LED on the selected DSU.
Test	Yellow	Mirrors the **Test** indicator on the selected DSU.
EC	Green	Error Correction indicator is for future use by dial network modems.

Control Panel Messages

This section shows the screen format of messages appearing on the control panel and describes the various messages.

Three types of messages are included: health and status, progress, and error messages.

Format

The format of the control panel messages is shown below.

Health and Status Messages

There are three types of health and status messages. Device Health and Status messages are described in Table C-3, Expanded Health and Status messages are described in Table C-4, and Subnetwork Health and Status messages are described in Table C-5.

Table C-3
(1 of 3)
Device Health and Status Messages

Message	Condition
CMI Fac Alarm	Facility Alarm on CMI (FacAlOnCMI) configuration option is enabled and control mode idle (CMI) is being received.
Config Corrupt	Configuration is corrupt. Reset all configuration options from one of the default (factory-loaded) option sets stored in the PTPC, PTPT, MPTC, or MPTT.
DBM:Device Fail	Internal failure is detected in the DBM.
DBM:Disable	DBM transmitter is disabled. DBM is in Idle mode, but no calls can be initiated or answered.
*nn.n*DBM:*mode*	*nn.n* indicates the DBM speed; *mode* is one of the following: Standby — A dialed connection is made, but the data is still routed over the DDS circuit. The first line shows the dial backup connection time. Active — A dialed connection is made, and data has been routed over that line.
*nn.n*ExternBU	*nn.n* indicates the external DBU's speed: External Bkup — Backup is in progress on an *external* DBU. (DDS line is disabled.)
DBMTst: *test*,*init*	The DBM is running a test, initiated from *init*. *test* is one of the following tests: BERT — Bit Error Rate Test BiL — Bilateral Loopback Dev — Device Test DL — Digital Loopback DT — Digital Test DTE — DTE Loopback E-E — End-to-End Test Lamp — Lamp Test RL — Remote Digital Loopback TM — Test Mode *init* is one of the following initiators: DTE — Data Terminal Equipment FP — Front Panel (the DCP) NMS — Network Management System Remt — Remote DSU

Table C-3
(2 of 3)
Device Health and Status Messages

Message	Condition
Dial Tone:Fail	Dial tone test was enabled and test failed.
DDS F: *alarm*	Digital facility alarm; *alarm* is one of the following network alarms: BiplrViol — Excessive Bipolar Violations Fac Alarm — Facility Alarm OutofServc — Out-of-Service condition No Signal — No signal has been received
DSU:Device Fail	Internal failure in the DSU is detected. (Go to the Test branch for Device Test.)
DSU:Disable	DSU transmitter is disabled. (Go to the Control branch to enable the DSU.)
DSUTst: *test*,*init*	The DSU is running a test, initiated from *init*. *test* is one of the following tests: BERT — Bit Error Rate Test BiL — Bilateral Loopback Dev — Device Test DL — Digital Loopback DT — Digital Test DTE — DTE Loopback E-E — End-to-End Test Lamp — Lamp Test NetL — Network Loopback RL — Remote Digital Loopback TM — Test Mode *init* is one of the following initiators: DTE — Data Terminal Equipment FP — Front Panel (the DCP) NMS — Network Management System Ntwk — Network Remt — Remote DSU
External Alarm A	The DSU detects a positive voltage on Pin 23. This alarm condition is defined by the Ext Leads configuration option.
External Alarm B	The DSU detects a positive voltage on Pin 19. This alarm condition is defined by the Ext Leads configuration option.
Invalid Address	A DSU was powered up with an invalid address. Invalid addresses are: 0 — This is reserved for the SDU 192 — This is reserved for the broadcast address 191 — Invalid for a DSU with a DBM because of the reserved **192** broadcast address 255 — Invalid for a DSU with a DBM

Table C-3
(3 of 3)
Device Health and Status Messages

Message	Condition
MUX Device Fail	Internal failure in the TDM/Flex is detected.
MUX CommunicFail	No reply from TDM/Flex. The DSU periodically polls the TDM/Flex for health and status. When the DSU does not receive a response, the message **MUX CommunicFail** appears in the Health and Status report.
Prt*nnn* Disable	Transmitter at port *nnn* (01 or 02, or All is disabled. (Go to the Control branch to enable the port.)
Port*nnn* DTR Alarm	The DTR lead at port *nnn* (01 or 02, or All) has been Off for more than 30 seconds.
Prt*nnn* StreamTerm	Streaming terminal. DTE at port *nnn* (01 or 02, or All) has its RTS lead turned ON longer than the predefined time.
P*nnn*Tst: *test,init*	The DSU is running a test on port *nnn* (01 or 02), initiated from *init*. *test* is one of the following tests: BERT — Bit Error Rate Test DL — Digital Loopback DT — Digital Test DTE — DTE Loopback RL — Remote Digital Loopback TM — Test Mode *init* is one of the following initiators: DTE — Data Terminal Equipment FP — Front Panel (the DCP) NMS — Network Management System Remt — Remote DSU
Redun Fan Alarm	Indicates a problem with the fan on the –48 Vdc Central Office Power Unit.
Redun Pwr Alarm	Indicates a problem with the power on the –48 Vdc Central Office Power Unit.
Subnetwrk Alarm	A major alarm was set Off by one of the devices in your subnetwork. Check the Subnetwork Health and Status report.
Sub-normal Speed	The DSU is operating at a dial backup speed that is less than the DDS network speed.
Subtree Truncat	Downstream health and status information has been truncated because it overflowed system limits.
OutofFrameThresh	For DSUs operating on a single port (rate adaption or nondisruptive), TDM, the local DSU has detected a continuous MUX Out-of-Frame condition. The alarm clears when a local DSU synchronizes with a remote DSU. On a point-to-point circuit, if the alarm continues and the local DSU is configured for automatic backup, the local DSU disruptively tests the DDS circuit. If the test fails, the local DSU initiates a DDS Facility Alarm and initiates dial backup.
nn.n DDS	Indicates the speed (*nn.n*) of the active core (DSU or DBM) when there are no alarms.

Table C-4
Expanded Health and Status Messages

Message	Condition
Dial Attempt:*nn*	The number (*nn*) of failures of dialing attempts since failure of private-line service. This message is cleared when the automatic backup process succeeds or the backup process is reset due to configuration option changes. When the maximum number of retries has been reached, **Max** appears.
Drop:DTR Disc	An established dialed connection fails because the DTR lead was turned Off.
Fail*n*:*reason*	Because of failure in the DDS private line, the DSU automatically originated several unsuccessful dialing attempts. The last three dial attempts are reported as Fail1 (oldest), Fail2, and Fail3 (most recent). The *reason* for failed dial attempts include: Abort Call — User aborted call. BadPermiss — A dial attempt was made, but a backup connection already exists. Bad Phone# — Unassigned number or illegal characters. Busy — Line or network busy. DBM Disab — DBM disabled; no call can be initiated or answered. DTR Discon — DTR disconnected. No Answer — There is no answer at the remote DBM or modem. No Dial Tone — No dial tone received from the network. No Ringing — DBM is not getting ringback from the other end. Security — Originating and answering DBMs have incompatible security levels or unmatched passwords. Training — V.32 modem training failure.
No Expanded H/S	There are no Expanded Health and Status messages.
Tries Timer:*nn*	The number of minutes left in Tries Time-out Timer (1 – 60) which is initially set to the time limit for dial backup call attempts. If the timer has expired, **Exp** appears.

Table C-5
Subnetwork Health and Status Messages

Message	Condition
Devic	TDM/Flex only: Device Failure. One of the following major alarms is in effect: Configuration Corrupt Device Test Failure MUX Device Failure
DialBU	Dial BackUp mode. Indicates that the DBM is active.
DialCN	Dial Connect. Indicates that the DBM is in Standby mode.
DialTn	Dial Tone Test failure.
Disab	Indicates that the DSU, DBM, or Port *nn* is disabled.
DTR	DTE alarm. Data Terminal Ready lead is Off.
ExtLd	External lead alarm a or b.
Facil	DDS facility alarm. Indicates a network facility alarm.
MUX	Indicates a MUX (TDM/Flex) failure.
NoResp	The active poll list member did not respond. Probable cause: a facility problem, a remote DSU problem, or an incorrect poll list.
Normal	Active poll list member does not report an alarm or its status.
RPower	Redundant power supply alarm.
Stndby	DBM is in Dial Standby.
Stream	Streaming terminal.
SubSpd	Subnormal operating speed.
Test	Test mode. It could be a DSU, DBM, or Port test.
Thresh	Threshold is exceeded.
TribTm	Multipoint tributary time-out. Multipoint tributary is not answering polls.
Trunc	Subtree truncation. More information is being received than can be returned in the poll. You must access each tributary for its messages.

Progress Messages

Table C-6 describes the command progress messages, and Table C-7 describes the dial backup progress messages.

Table C-6
Command Progress Messages

Message	Condition
Please wait . . .	Command is taking more than 2 seconds to complete.
Command Complete	Command has been completed.
Command Failed	Command was unable to be executed.

Table C-7
Dial Backup Progress Messages

Message	Condition
DBM:Answering	DBM is answering an incoming call.
DBM:Callback	Callback sequence has initiated.
DBM:Connected	DBM is connected.
DBM:Disabled	No calls can be initiated or answered.
DBM:Ringing	Ringing at remote DBM or *external* DBU (dial backup unit).
DBM:Standby	A connection is made but the digital circuit is still the active link.
DBM:Starting Up	The DBM is training for synchronization.
DBM:WaitForAnswr	A call has been placed and the DBM is waiting for connection.
DBM:Wait Callbck	The DBM is expecting a call back from remote DBM or *external* DBU.
DBM:xxxxxxxxxxx	The last 11 digits for the telephone number that has been dialed.
ExtBU Active	Data has been routed to the ExtBU *external* DBU.
ExtBU Inact	ExtBU is enabled, but the *external* DBU is not active.

Error Messages

Table C-8 describes the command error messages, Table C-9 describes the dial backup error messages, and Table C-10 describes the TDM/Flex error messages.

Table C-8
Command Error Messages

Message	Condition	Action
Conflict w/Envir	Command conflicts with a test in progress, or the configuration is inappropriate for this command, etc.	1. Check for a test in progress. 2. Either wait for the test to finish or abort the test. 3. If there is no test in progress, check configuration options.
Not in Menu	Command is not in the supported set.	Use a valid command.
No Response	Invalid remote address or remote device is not powered, connected to network, or enabled.	Check remote address.
Command Failed	Command could not execute and none of the error messages above apply.	If problem cannot be corrected, call your service representative.
Inval Selection: No Valid Choices	Invalid menu selection based upon previous selections that caused a menu to display with no selectable options.	Press any key to return to the top-level menu.

Table C-9
Dial Backup Error Messages

Message	Notify NMS[1]	Condition	Action
DBM: Busy	Yes	Telephone line associated with remote DBM is busy.	Try again. Try another number if possible, or investigate why the line is busy.
DBM: Call Aborted	No	Call was aborted from the DCP.	None
DBM:Callbck Fail	No	There was a failure to connect on a callback attempt.	Make sure you have the correct call setup pointer and that remote DBM has the proper telephone number in that directory. If both are correct, attempt to place a manual call from the remote DBM.
DBM: Conflict w/Envir	Yes	DBM is not able to dial out (e.g., test is being run); there is no DBM at the far end.	Wait until the test is completed, or abort the test.
DBM:Dir Empty	Yes	An attempt was made to place a call from an empty directory.	Check Backup Directory entries and numbers.
DBM:DTR Discon	Yes	DTR has gone low, or the call did not connect.	Raise DTR at the DTE, or disable the DTRCallCon configuration option.
DBM:Illegal Char	Yes	Illegal character in the directory specified.	Check directory entry.
DBM:No Answer	Yes	There was no answer from the remote DBM or modem.	1. Check that remote DBM is configured for many calls. 2. Make sure remote DBM is properly connected to the dial network. 3. Check operational status of remote DSU using a Device Test. 4. Attempt to place a call from remote DBM. If it cannot be placed, replace the DBM.
DBM:NoDialTone	Yes	No dial tone received from the network.	Check the dial network connections. If conditions are good and no problem is found, call telephone company and report the problem.
DBM:No Ringing	No	DBM is not getting ringback from the other end.	Look for line problems. If conditions are good and no problem is found, call telephone company and report the problem.
DBM: NotConnected	No	Call attempt failed for unspecified reasons.	1. Check DBM for proper operation by running a Device Test. 2. Check the DBM's configuration options to ensure that DBM is enabled. 3. If you cannot correct the problem, contact your service representative.
DBM: RateMismatch	Yes	The rate in the calling and called DBM or modem are not compatible.	Check speed configured in both units.
DBM:SecurityFail	No	Passwords in calling and called DBM do not match.	1. Make sure that both DBMs have compatible security options. 2. Make sure that both DBMs have the proper password.

[1] If Yes, an error message is reported to the NMS if the NMS initiated the **dial** command.

Table C-10
(1 of 3)
TDM/Flex Error Messages

Message	Condition	Action
All Async >Aggr	All ports of the TDM/Flex are configured for asynchronous operation and their combined corresponding synchronous rate exceeds the value for the DSU, DBM, or ExtBU Rate(Kbps) configuration option. If all ports are assigned to asynchronous operation, the sum of the corresponding synchronous port speeds must be *less than* the value of the DSU, DBM, or ExtBU rate.	You can correct the problem in one of two ways: 1. Set the Rate(Kbps) of the DSU, DBM, or ExtBU to a higher value. 2. Lower the port speeds of the DSU, DBM, or ExtBU in the PrtSp configuration submenu.
Async Undspeed	An attempt was made to run an TDM/Flex asynchronous port at underspeed. A port configured for asynchronous operation *cannot* be configured to run underspeed.	Choose a synchronous port and configure it for underspeed via the appropriate path (DSU or DBM) in the PrtSp configuration submenu.
DBM Aggreg Exceeded DSU Aggreg Exceeded ExtBU Agg Exceed	The sum of the TDM/Flex port speeds is *greater than* the value for the DSU, DBM, or ExtBU Rate(Kbps) configuration option.	You can correct the problem in one of two ways: 1. Set the Rate(Kbps) of the DSU, DBM, or ExtBU to a higher value. 2. Lower the DSU, DBM, or ExtBU port speeds via the appropriate path (DSU or DBM) in the PrtSp configuration sub-menu.
DSD Speeds diff	Not all of the TDM/Flex ports in the digital-sharing group are set to the same speed.	Set all of the ports in the digital-sharing group to the same speed via the appropriate path (DSU or DBM) in the PrtSp configuration submenu.
DSD Wrong RTS	One or more TDM/Flex ports in a digital-sharing group with DSD port control have an incorrect RTS Control setting. Each port in a digital-sharing group configured for contention *must* have its RTS Control configuration option set to DTE (RTS Cntrl: DTE).	Set RTS Cntrl to DTE for all ports in the digital-sharing group via the appropriate paths (Prt1 and Prt2) in the MUX configuration submenu.
Ext Time undspd	The TDM/Flex port selected as the source of external timing (TxClkSource is set to the port specified in the DSU (or ExtBU) and/or DBM configuration submenu) is also an underspeed port. A port *cannot* be the source of external timing and also run underspeed.	Correct the problem in one of two ways: 1. Configure another synchronous port as underspeed via the appropriate path (DSU or DBM) in the PrtSp configuration submenu. 2. Configure the other port to provide external timing.
Incmpt Diag mode	**Mixed** diagnostic type is not compatible with point-to-point operation.	Select another diagnostic type via the Diagnostic DSU, DBM, or ExtBU option set.
Inval lowest Prt	DCE (the first port on TDM/Flex) was previously selected as the second port in a digital-sharing group.	Select 1 as the first port for the digital-sharing group via the MUX Setup path of the MUX submenu.

Table C-10
(2 of 3)
TDM/Flex Error Messages

Message	Condition	Action
Invalid timing	A TDM/Flex port (Prt1 or Prt2) was previously selected as the source of external timing when the TDM/Flex was enabled. Now, the TDM/Flex is enabled.	Set TxClkSource to any of the valid timing sources (external timing is set to **Ext** for the DSU (or ExtBU) and/or the DBM).
	Ext was previously selected as the source of external timing when the TDM/Flex was disabled, and the TDM/Flex is now enabled.	Set TxClkSource to any of the valid timing sources (external timing is set to **Prt1** or **Prt2**).
No 1.2 @ 56K,64K	A TDM/Flex port is configured for a synchronous rate of 1200 bps and the DSU rate is set to 56 kbps.	Correct the problem in one of two ways: 1. Increase the speed of the port to *at least* 2400 bps via the DSU path in the PrtSp configuration submenu. 2. Set the DSU rate to a value *less than* 56 kbps.
OnePrt no undspd	Only one TDM/Flex port is active, and an attempt is made to configure it for underspeed; no underspeed port is required.	Disable the port's underspeed configuration option via the appropriate path (DSU or DBM) in the PrtSp submenu.
Port Off Undersp	A TDM/Flex's port is disabled and is also set to run underspeed; port that is disabled *cannot* run underspeed.	Correct the problem in one of two ways: 1. Set the port speed to *any value but* Disab in the PrtSp configuration submenu. 2. Select another synchronous port to run underspeed via the appropriate path (DSU, DBM, or ExtBU) in the PrtSp submenu.
RTS/AnStr Conflc	A port's AntiStreaming and RTS Control settings are *not* compatible. For AntiStreaming to be in effect, RTS Control *must* be set to DTE.	Set RTS Control to DTE via the appropriate path (Prt1 or Prt2) in the MUX submenu.
RTS/TxCrr Conflc	A port's TxCarrSel (Transmitter Carrier Select) and RTS Cntrl (RTS Control) settings are *not* compatible. When a port's TxCarrSel is set to **Cntrl**, RTS Cntrl *must* be set to DTE. When a port's TxCarrSel is set to **Const**, RTS Cntrl *must* be set to FrcOn.	Set Transmitter Carrier Select (TxCarrSel) and RTS Control (RTS Cntrl) to compatible settings via the appropriate path (Prt1 or Prt2) in the MUX submenu.

Table C-10
(3 of 3)
TDM/Flex Error Messages

Message	Condition	Action
Sync >Async Req	The port's asynchronous rate setting requires that more capacity (bandwidth) be allocated to the port. Asynchronous rates of 150, 300, 600, and 1200 bps require the allocation of 1200 bps. Exception: At a line speed of 56 kbps, asynchronous rates 150, 300, 600, and 1200 bps require the allocation of 2400 bps. Asynchronous rate of 1800 bps requires the allocation of 2400 bps. For all other available asynchronous rates, the asynchronous rate equals the synchronous rate.	Allocate more capacity (bandwidth) to the port; that is, set the port rate to a higher speed via the PrtSp submenu.
Sync Port Requir	The sum of the TDM/Flex port speeds equals the DSU/DBM rate, and all ports are configured for asynchronous operation.	Correct the problem in one of two ways: 1. Increase the DSU's, DBM's, or ExtBU's data rate. 2. Decrease the DSU, DBM, or ExtBU port speeds and the Async rate via the PrtSp submenu.
Undersp Required	The sum of the TDM/Flex port speeds equals the DSU, DBM, or ExtBU rate, and at least one port is configured for synchronous operation, but no port is configured for underspeed.	Configure the synchronous port to underspeed via the appropriate path (DSU or DBM) in the PrtSp submenu.
10BPC & 2 Stops	An attempt is made to configure the asynchronous character format for 10 bits per character, plus 2 stop bits. Two stop bits are *not allowed* when there are10 bits per character.	Select 1 for Stop Bits via the appropriate path (Prt1 or Prt2) in the MUX submenu.
Too Many Ports	The Lowest Port Number and Number of Ports in Group specifications for a digital-sharing group cannot be realized.	Select new specifications for the digital-sharing group via the Setup path in the MUX submenu.

Pin Assignments D

Overview D-1

Overview

Pin assignments for the 3550 Series DSU connectors and interfaces are included here. Refer to them as needed.

- Figure D-1 shows the Model 3550 DSU's digital network connector, which is used for DDS connection.
- Table D-1 provides the digital network connector's pin assignments.
- Table D-2 provides the network connector pin assignments used for the V.32 DBM, which uses a 6-pin jack (not shown in any figure).
- Figure D-2 shows the 3600 Hubbing Device.
- Table D-3 shows the 3600 Hubbing Device's pin assignments.
- Table D-4 provides the 3600 Hubbing Device's CC IN/DC OUT jack pin assignments.
- Figure D-3 shows the Model 3551 DSUs rear connector plate.
- Table D-5 provides the EIA-232/V.24 connector's pin assignments.
- Figure D-4 shows the V.35 adapter that is shipped with the rear connector plate; it provides the interface between the port's D-type connector and the DTE cable's V.35 connector.
- Table D-6 provides the 25-pin V.35 connector and the V.35 adapter's pin assignments.
- Figure D-5 shows the EIA-232-D crossover cable and its pin assignments.
- Figure D-6 shows the V.35 crossover cable and its pin assignments.

Refer to the *COMSPHERE 3000 Series Carrier, Installation Manual* for additional pin assignments.

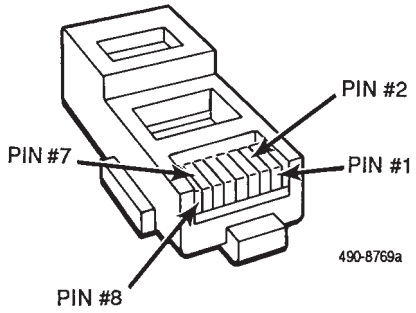

Figure D-1. Digital Network Connector

Table D-1
Model 3550 – Digital (DDS) Network 8-Pin Cable Connector Pin Assignments

Pin	Circuit	Function
1	R1	Transmit data to local loop
2	T1	Transmit data to local loop
7	T	Received data from local loop
8	R	Received data from local loop

Table D-2
Model 3550 – Dial (Analog) Network 6-Pin Cable Connector Pin Assignments

Pin	Circuit	Function
3	T	Tip – V.32 DBM
4	R	Ring – V.32 DBM

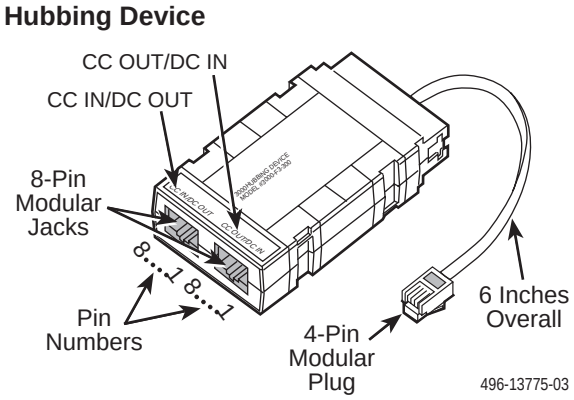

Figure D-2. 3600 Hubbing Device (3600-F3-300)

Table D-3
3600 Hubbing Device Pin Assignments

Pin #	Signal Name	Input/Output
1	+5 Vdc	Input
2	DCOSD/CCIRD	Input
3	Signal Ground	Ground
4	DCORD/CCISD	Output

Table D-4
3600 Hubbing Device CC IN/DC OUT Jack Pin Assignments

Pin #	Signal Name	In/Out	CC IN	DC OUT
1	–V Pass-Through	—	N/C	N/C
2	DCOCTS/CCIRTS	IN	RTS	CTS
3	DCORTS/CCICTS	OUT	CTS	RTS
4	DCOSD/CCIRD	OUT	RD	SD
5	Signal Ground	—	GND	GND
6	DCORD/CCISD	IN	SD	RD
7	N/C	—	N/C	N/C
8	+V Pass-Through	—	N/C	N/C

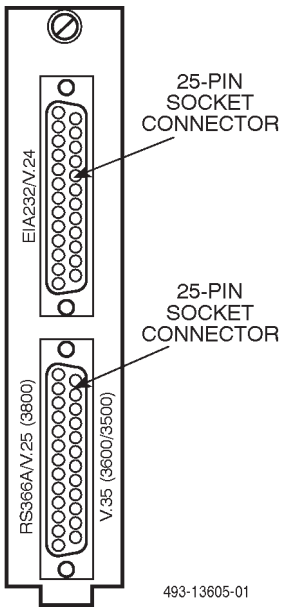

Figure D-3. Model 3551 DSU 25-Pin EIA-232/25-Pin V.35 Rear Connector Plate (3000-F1-021)

Table D-5
EIA-232/V.24 Connector Pin Assignments

Pin	Circuit Name		Function
	EIA-232	ITU-T	
2	BA	103	Transmit Data (TXD)
3	BB	104	Received Data (RXD)
4	CA	105	Request-to-Send (RTS)
5	CB	106	Clear-to-Send (CTS)
6	CC	107	Data Set Ready (DSR)
7	AB	102	Signal Ground (SG)
8	CF	109	Received Line Signal Detect (LSD)
9	—	—	Positive Test Voltage
10	—	—	Negative Test Voltage
12	CI	112	Data Signal Rate Selector I – DCE Source (alternate external control lead I)
13[1]	—	—	Data Signal Rate Selector II – DCE Source (alternate external control Lead II)
14	SBA	118	Secondary Transmit Data
15	DB	114	Transmitter Signal Element Timing – DCE Source
16	SBB	119	Secondary Received Data
17	DD	115	Receiver Signal Element Timing – DCE Source
18	LL	141	Local Loopback (LL)
19[1]	—	—	Data Signal Rate Selector II – DTE Source (alternate external control alarm Lead II)
20	CD	108.2	Data Terminal Ready (DTR)
21	RL	140	Remote Digital Loopback (RL)
23[1]	CH	111	Data Signal Rate Selector I – DTE Source (alternate external control alarm Lead I)
24	DA	113	Transmitter Signal Element Timing – DTE Source
25	TM	142	Test Mode (TM)

[1] Data Signal Rate Selector function is not available at this time. These leads can be used for the External Lead functions.

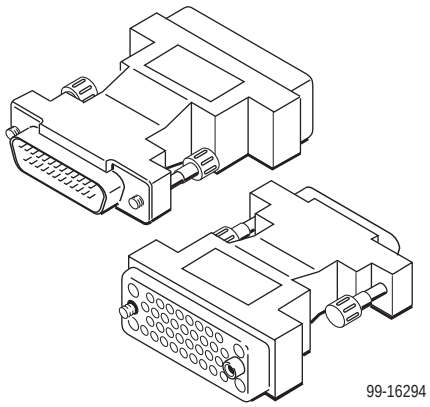

Figure D-4. V.35 Adapter (3000-F1-510)

Table D-6
V.35 Connector Pin Assignments

25-Pin Connector (Rear Connector Plate)	34-Pin Connector (V.35 Adapter)	Circuit Name
Pin Number	Pin Number	
7	B	Signal Ground
4	C	Request-to-Send (RTS)
5	D	Clear-to-Send (CTS)
6	E	Data Set Ready (DSR)
8	F	Received Line Signal Detect (LSD)
20	H	Data Terminal Ready (DTR)
21	J	Ring Indicator (RI)
18	L	Local Loopback (LL)
19	N	Remote Digital Loopback (RL)
24, 11	P, S	Transmit Data (TXD)
23, 22	R, T	Received Data (RXD)
15, 2	U, W	Transmitter Signal Element Timing – DTE Source
16, 3	V, X	Receiver Signal Element Timing – DCE Source
14, 1	Y, AA	Transmitter Signal Element Timing – DCE Source
9	HH	Positive DC test voltage
10	KK	Negative DC Test Voltage
25	NN	Test Mode (TM)

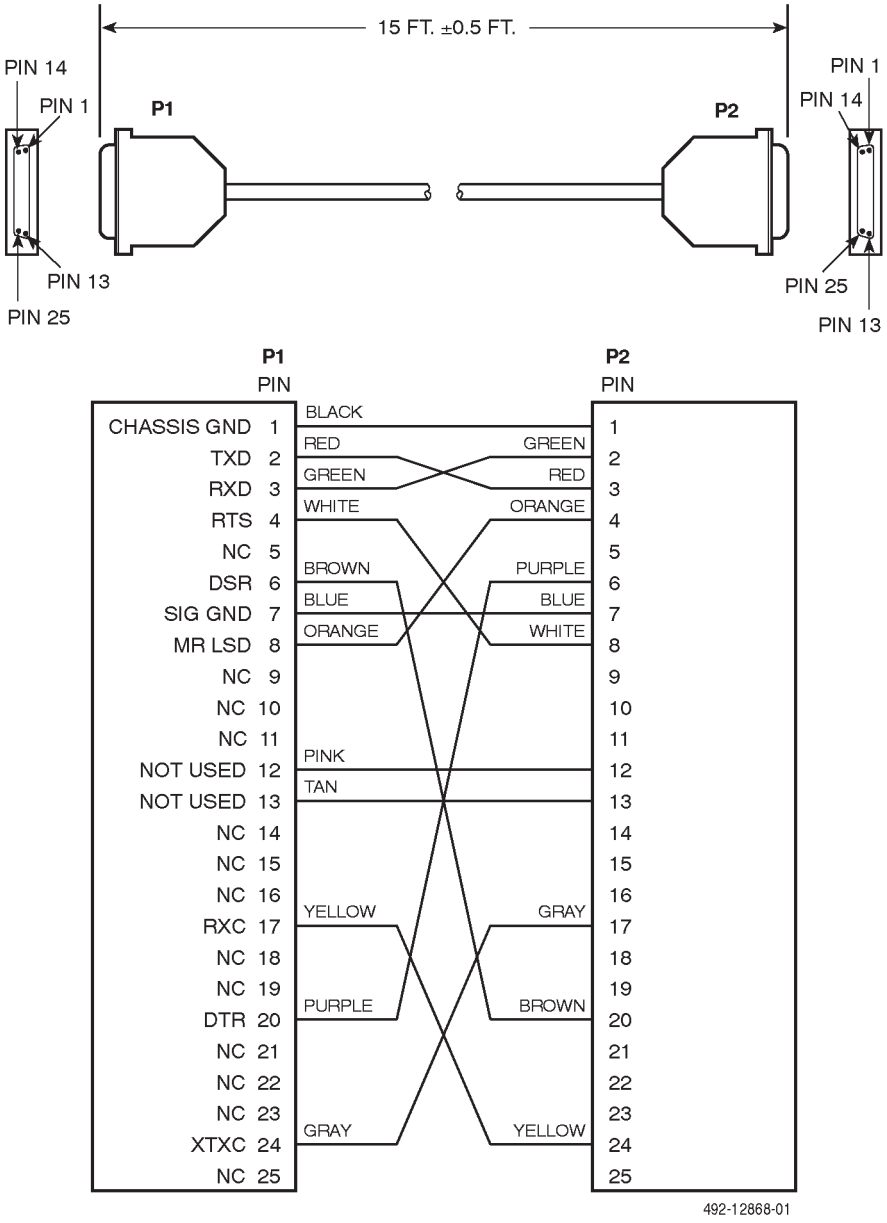

Figure D-5. EIA-232-D Crossover Cable (4951-035F)

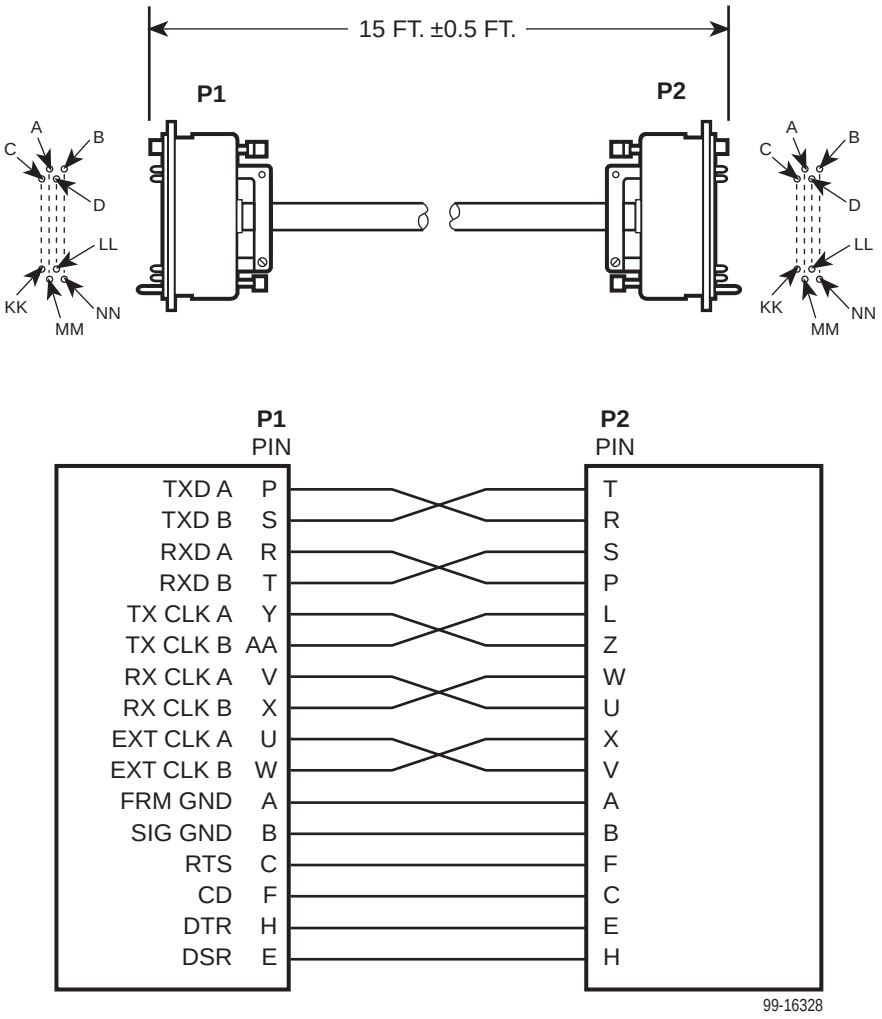

Figure D-6. V.35 Crossover Cable (3211-178F)

Application Configurations E

Overview E-1
Point-to-Point Applications E-1
Multipoint Applications E-3

Overview

This appendix shows examples of typical point-to-point and multipoint applications for both control and tributary DSUs. Refer to Figures E-1 and E-2 when configuring your network.

Point-to-Point Applications

Model 3550 and Model 3551 DSUs provide both single-port circuit support; only the Model 3550 DSU supports TDM/Flex circuit support.

When a V.32 DBM is installed, the DSU provides full backup capability when operating at speeds of 14.4 kbps or below. Backup can be automatic, or it can be initiated manually from the DSU's control panel or a 6700 Series NMS.

External dial backup units (DBUs), like 3800 Series modems, can also be used for backup when the *External Backup* (ExtBU) configuration option is enabled (refer to Chapter 5).

Figure E-1 shows a point-to-point configuration using both a carrier-mounted Model 3551 DSU and a standalone Model 3550 DSU configured as controls. These units have the PTPC configuration. The standalone DSU shows both a DBM and a TDM/Flex installed; the carrier-mounted DSUs are equipped with DBMs.

On the tributary side of the configurations a Model 3550 DSU is paired with a 3800 Series modem for backup. Other tributaries, each equipped with a DBM and TDM/Flex, are shown; one is paired with a carrier-mounted DSU, and the other is paired with another standalone DSU.

Refer to your 6700 Series NMS documentation before connecting the NMS to the circuit.

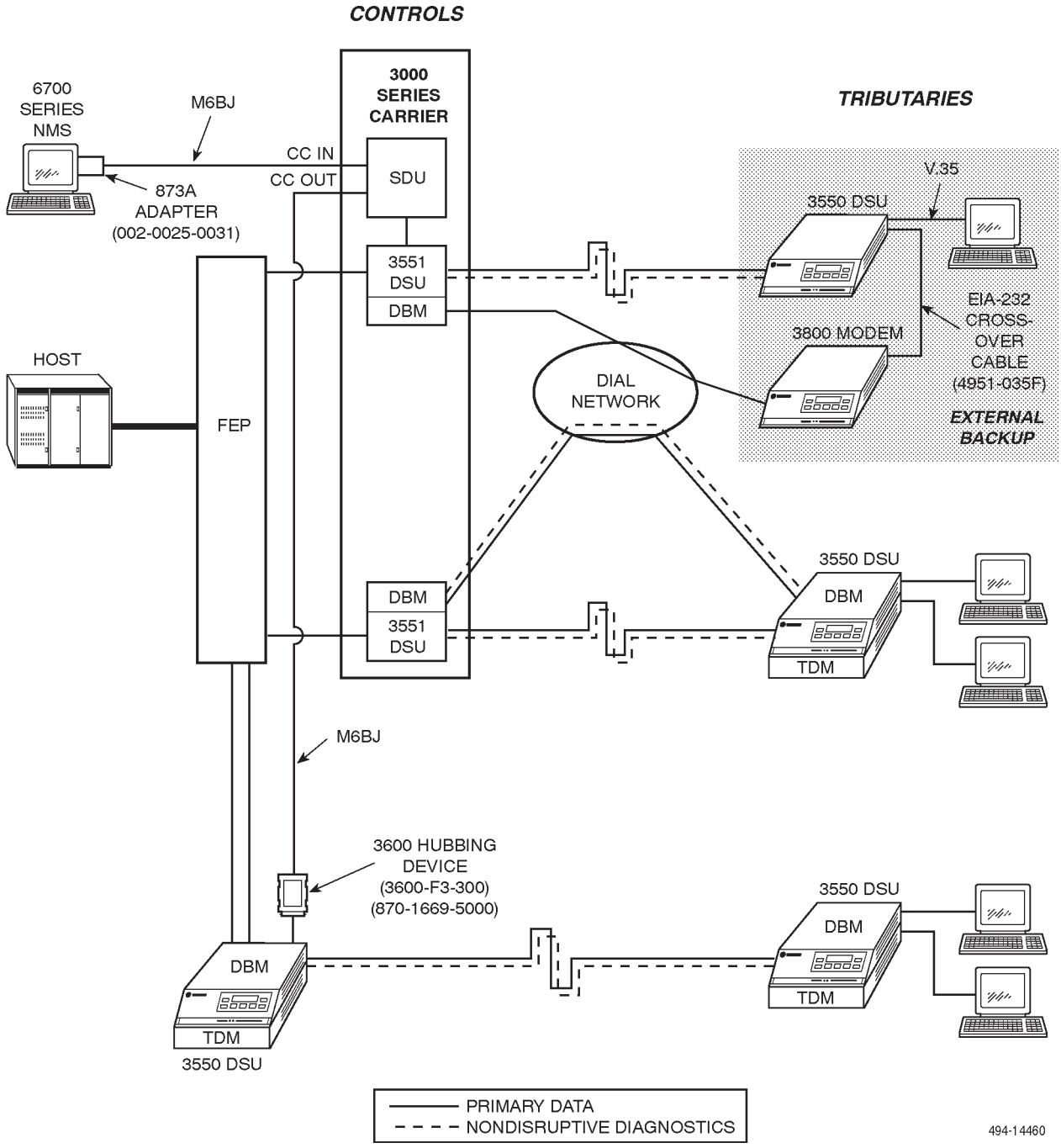

Figure E-1. Point-to-Point Application Configurations with Internal and External V.32 Backup

Multipoint Applications

Model 3550 and Model 3551 DSUs also provide high-speed multipoint circuit support. The network can be controlled from the DSU's control panel or a 6700 Series NMS. Figure E-2 shows sample multipoint configurations.

Using this application, backup is provided via modems rather than a DBM. In this case, a matrix switch at the control site switches data from the FEP ports to the modems.

On the tributary side of the configurations, either standalone Model 3550 DSUs equipped with DBMs or connected to an external DBU are shown.

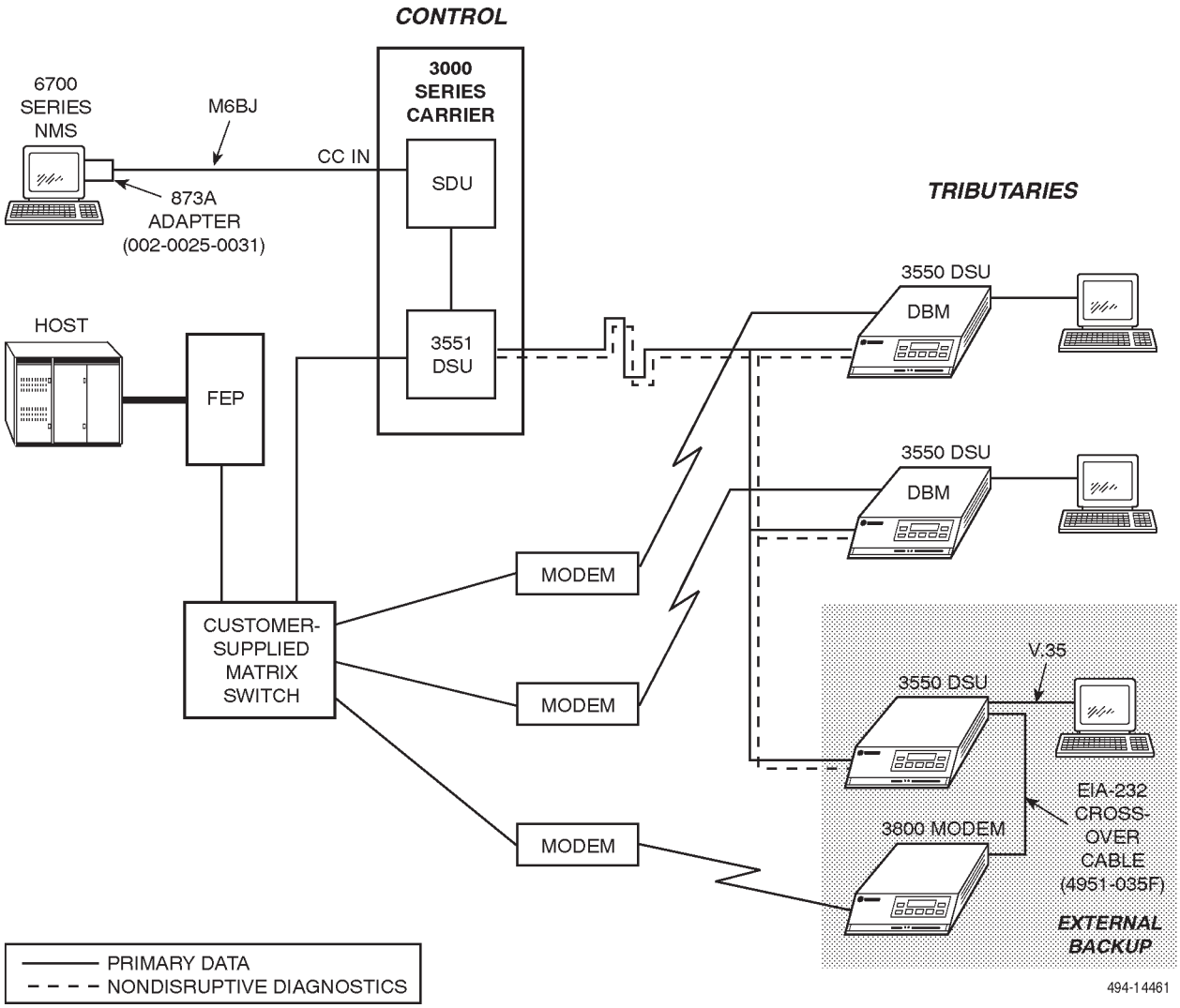

Figure E-2. Multipoint Application Configurations

Equipment List F

Equipment	Feature/Part No. G = Factory Install. F = Field Install.	Comcode
Model 3550 Standalone DSU	3550-A1-001	107330029
With V.32 bis 14.4 kbps DBM	3550-A1-002	107330037
With 2-port TDM/Flex	3550-A1-003	107330045
Model 3551 Carrier-Mounted DSU (includes rear connector plate)		
Without Options	3551-B1-001	107330052
With V.32 bis 14.4 kbps DBM	3551-B1-002	107330060
Field Installation		
For Model 3550/3551 V.32 bis14.4 kbps DBM	3550-F1-201	107329922
For Model 3550 2-port TDM/Flex	3550-F1-202	107329930
Factory Installation		
For Model 3550 V.32 bis14.4 kbps DBM	3550-G1-201	107329955
Rear Connector Plate – 25-Pin EIA-232/25-Pin V.35	3000-F1-021	106476229
V.35 Adapter (For V.35 operation – Port 2 of Model 3550 2-port TDM/Flex)	3000-F1-510	106476237
ACCULINK 3100 Series CSU Wall-Mount Adapter (for Model 3550)	3100-F1-400	406941674
Model 3551 Digital (DDS) Network Cables		
50-pin to eight 6-pin Multiple Network Interface Adapter (1.5′)[1] (Model 3551 in Canada)	3000-F1-009	106459621
50-pin to eight 8-pin Multiple Network Interface Adapter (1.5′)[1] (Model 3551 in U.S.A.)	3600-F2-503	106303837
Model 3551 Dial (PSTN) Network Cable Adapter[1]		
50-pin to eight 6-pin RJ11C/Permissive Cable (1.5′)	3600-F2-505	106459928
50-pin to eight 8-pin RJ45S/Programmable Cable (1.5′)	3600-F2-504	106459548
3600 Hubbing Device	3600-F3-300	106744683
NMS Adapter Cable/Diagnostic Extension	3000-F2-510	106768690
NMS EIA-232-D Interface Connector		
6700 Series NMS Adapter 873A	4400-F1-594	106473150
NMS 6-pin Modular Cable – M6BK	3′—4400-F1-510 10′—4400-F1-511 25′—4400-F1-512	106472830 106472848 106472855

[1] These cables are extended using 3000-F1-013/014 cable.

Equipment	Feature/Part No. G = Factory Install. F = Field Install.	Comcode
Model 3550 Dial (PSTN) Network Interface Cables		
Telephone Cord 6-pin modular RJ11C/Permissive Plug	7′ — 4400-F1-531 14′ — 3600-F3-503 25′ — 4400-F1-533	106472913 107331357 106472921
Telephone Cord 8-pin Modular RJ45S/Programmable Plug	2.5′ — 4400-F1-541 14′ — 4400-F1-543 25′ — 4400-F1-544	106472947 106472962 106472970
Model 3550 Digital (DDS) Network Interface Cables – RJ48S		
Network Cable (14′ cord included with Model 3550)	14′ — 3600-F3-501 25′ — 3600-F3-502	107331381 107331365
8-pin to 6-pin Modular (7′) Cable (Model 3550 in Canada)	3000-F1-006	106239155
Model 3550 25-pin Plug to EIA-232 Plug Cable for extended circuits (select one)		
EIA-232 Crossover Cable Pin-to-Pin EIA-232 Cable (straight connection)	15′ — 4951-035F 10′ — 4951-032F	105757520 105757496
V.35 Crossover Cable	15′ — 3211-178F	106910466
COMSPHERE 3000 Series Carrier, Installation Manual	3000-M3-001	—
COMSPHERE –48 Vdc Central Office Power Unit, Installation Manual	3000-A2-GB41	—
COMSPHERE 3550 Series Data Service Units, Models 3550 and 3551, User's Guide	3550-A2-GB20	—

Equipment*	Part Number
Field Service Spares	
For Model 3550 DSU	870-1858-8001
2-Port TDM/Flex	870-1871-8001
For Model 3551 DSU	870-1859-8001
For Model 3550/3551 V.32 bis14.4 kbps DBM	
DBM Core	102-0144-0031
Line-Interface	870-1571-8000
Rear Connector Plate – 25-Pin EIA-232/25-Pin V.35	869-2211-0011
V.35 Adapter (For V.35 operation – Port 2 of Model 3550 2-port TDM/Flex)	002-0096-0031
ACCULINK® 3100 Series CSU Wall-Mount Adapter (for Model 3550 DSU)	
Wall-Mount Bracket (1)	870-1751-0014
17″ Velcro® Brand Straps (2)	870-1770-0022
RS-310-C L Bracket (1)	870-1809-0023
#6 x 1.0″ Screws (4)	870-1817-0023
#12-24 Screws (2)	506-0025-0031
#10-32 Screws (2)	503-0002-0131
Clip Nuts (2)	302-2508-0131
Ferrite Choke	175-0018-0031
LCD (16 characters by 2 lines) with Cable	153-0009-1131
Membrane Switch	631-0014-0031
Table-Top AC Transformer (included with Model 3550)	654-0099-0131
3600 Hubbing Device	870-1669-5100
NMS Adapter Cable/Diagnostic Extension	1.5′ — 035-0173-0031
NMS EIA-232-D Interface Connector	
6700 Series NMS Adapter 873A	002-0025-0031
NMS 6-pin Modular Cable – M6BK	3′ — 035-0145-0331 10′ — 035-0145-1031 25′ — 035-0145-2531

* For use by Field Service personnel.

Equipment*	Part Number
Model 3550 Digital (DDS) Network Interface Cable – RJ48S	
Network Cable (14′ cord included with 3550)	14′— 035-0267-1431 25′— 035-0267-2531
8-pin to 6-pin Modular Cable (Model 3550 in Canada)	7′ — 035-0279-0031
Model 3550 Dial (PSTN) Interface Cable	
Telephone Cord 6-pin Modular RJ11C/Permissive PSTN Plug – D4BU	7′ — 035-0274-0731 14′ — 035-0266-1431 25′ — 035-0274-2531
Telephone Cord 8-pin Modular RJ45S/Programmable PSTN Plug – D8W	2.5′ — 035-0116-0231 14′ — 035-0116-1431 25′ — 035-0116-2531
Model 3550 25-pin Plug to EIA-232 Plug Cable for extended circuits (select one)	
EIA-232 Crossover Cable Pin-to-Pin EIA-232 Cable (straight connection)	15′ — 818-2759-0111 10′ — 835-4507-1011
V.35 Crossover Cable	15′ — 835-1092-0011
Model 3551 Digital (DDS) Network Cables	
50-pin to eight 6-pin Multiple Network Interface Adapter[1] (Model 3551 in Canada)	1.5′ — 035-0258-0231
50-pin to eight 8-pin Multiple Network Interface Adapter[1] (Model 3551 in U.S.A.)	1.5′ — 035-0256-0231
Model 3551 Dial (PSTN) Network Cable Adapter[1]	
50-pin to eight 6-pin RJ11C/Permissive Cable 50-pin to eight 8-pin RJ45S/Programmable Cable	1.5′ — 035-0255-0231 1.5′ — 035-0257-0231
COMSPHERE 3000 Series Carrier, Installation Manual	3000-A2-GA31
COMSPHERE –48 Vdc Central Office Power Unit, Installation Manual	3000-A2-GB41
COMSPHERE 3550 Series Data Service Units, Models 3550 and 3551, User's Guide	3550-A2-GB20
[1] These cables are extended using a 035-0254-1031/3031 cable.	

* For use by Field Service personnel.

Glossary

active core	The core that is transmitting data. For example, the DBM is the active core when the unit is in Backup mode.
Advanced Diagnostic protocol (ADp)	The network management protocol used by the COMSPHERE 6700 Series NMS. It provides diagnostic communication for the network.
auto backup	A function of the dial backup module (DBM), an *external* dial backup unit (DBU), or a carrier-mounted dial backup unit. With automatic backup, the DSU automatically activates the DBM to reestablish a line when a facility alarm is detected from the DDS network.
auto restoral	A function of the DBM or *external* DBU, whereby the DSU automatically returns to the DDS network when service is restored over the private line. On point-to-point circuits, the DSU test the integrity of the DDS network before switching data back to the private line.
backup	See auto backup.
Bilateral Loopback	A combination of the DTE and Digital Loopbacks operating simultaneously in the same DSU. This test is selected from the General configuration option set (Bilat Lpbk: Enab).
Bit Error Rate Test (BERT)	A test used to analyze the network circuit. Both the control and tributary DSUs must be connected to the network. The originating DSU sends a 511-bit test pattern, transmitting over the DDS network for a DSU; over the dial network for a DBM.
broadcast	A method of transmission. The simultaneous transmission to two or more communicating devices.
buffer	A device for temporary storage of data.
callback directory pointer	The directory entry in an originating DBM consists of the answering DBM's telephone number, a delimiting character, and a callback pointer. The pointer identifies the originating DBM's telephone number in the answering DBM's Backup Directory.
carrier	The device for mounting circuit cards that contains 17 slots: 1 control slot for an SDU and 16 slots for data communications devices like DSUs and modems.
carrier-mounted	A Model 3551 DSU that is designed for installation in a COMSPHERE 3000 Series Carrier used at central-site operations.

CCITT	Consultative Committee on International Telegraphy and Telephony. An advisory committee established by the United Nations to recommend communications standards and policies. It was renamed ITU in March 1993.
clamping	A function of the DSU that forces the output signal to go low (Off) and causes the DSU to ignore input signals.
CMI	Control Mode Idle. A control signal sent over the DDS line to indicate that no data activity is being sent.
collision	A collision occurs when two tributary DSUs transmit data onto the network at the same time. The transmissions interfere with each other and neither is successfully received.
control	A DSU or modem that is, for diagnostic purposes, at the logical head of a hierarchical network. It is the unit from which tests and commands are issued to other units on the same circuit. There is only one control per link.
Control Channel (CC)	The diagnostic interface between the 6700 Series NMS and the SDU for a Model 3551 DSU, and the Hubbing Device for the Model 3550.
core	A function of the circuit card that provides data transmission capability. With Model 3550 or Model 3551 DSUs, there are two cores – one for the DSU and one for the DBM, and the data can be transmitted through either (also see active core).
CSA	Canadian Standards Association.
CTS	The state of the Clear-to-Send lead.
Data Communications Equipment (DCE)	A device, such as a DSU or modem, that provides an interface between a DTE device and a digital or dial/analog network (also called data circuit-terminating equipment).
data router	A sophisticated circuit switch in the DSU that is capable of connecting several communication interfaces in more than one way, redirecting or routing data to an alternate path.
Data Service Unit (DSU)	A DCE device that interprets, interfaces, and provides timing and signal control between a DTE device and a digital network.
Data Terminal Equipment (DTE)	A computer or peripheral device, such as a terminal or printer; a data source or sink.
DBM	The V.32 dial backup module that can be ordered for the DSU. This module operates at 14.4 kbps and provides an alternate data path in case of failure of the digital connection through the dial network.
DDS	Digital Data Service, such as the ACCUNET® Spectrum of Digital Services that provides digital (not dial) communication circuits.
dedicated backup	A dial backup module (DBM) assigned to a particular DSU that is continually available for service restoration. The DBM switches to Dial Backup mode automatically when the DDS line fails; no switching is required. An *external* dial backup unit (DBU) can also provide dedicated backup.

Device Test (Devic)	A test that uses an internal test pattern generator built into the DSU to verify that the DSU (or DBM) is working properly. The generator sends a test message to the device's transmitter, where it is looped back to the device's receiver. The incoming message is then checked for errors, which are reported as *Pass* if there are no errors, and *Fail* if an error is found.
Diagnostic Control Panel (DCP)	The face of the DSU that continuously provides status information about the DSU's operation and allows an operator to manage its operation. This is a generic term used for both the standalone and carrier-mounted DSU models. See shared diagnostic control panel (SDCP) for the Model 3551.
Dial Backup Unit (DBU)	An *external* digital or analog device, attached to the Model 3550 or 3551 DSU, that is used for dial restoral (also see DBM).
dial string	A sequence of up to 36 characters that the DBM can send into the dial network to establish a call to a remote backup device. It consists of a telephone number and may include other information, such as a callback directory pointer.
Digital Loopback (DL)	A test used for manual testing of the remote end of a circuit. For example, a DL may be required to complete an external bit error rate test (BERT) from the remote DSU. The local DSU receives test data, loops it back to the transmitter, and returns it to the network.
Digital Test (DT)	A test used to test two DSUs and the circuit between them. Both DSUs must be connected to the network before this test is run.
DIP switch	Dual In-line Package switch.
DMI	Data Mode Idle. Refers to a sequence of 1s transmitted or received on the DDS network. When the General (Gen) branch configuration option RTS Cntrl is set to FrcOn, the DSU will transmit DMI whenever RTS is Off. Data Mode Idle operation is recommended for point-to-point applications.
DOC	Canadian Department of Communication.
drop	A tributary site.
DSR	The state of the Data Set Ready lead.
DTE Loopback (DTE)	A test that allows you to test each port independently. This test loops the data path at the DTE interface.
DTR	The state of the Data Terminal Ready lead.
EIA	Electronic Industries Association. This organization provides standards for the data communications industry to ensure uniformity of interface between DTEs and DCEs.
elastic store	A configuration option that is enabled in a tributary DSU to compensate for phase differences between DDS network timing and the received timing of an analog (dial) modem or DSU. It uses a buffer storage area of 16 bits.
End-to-End Test (EE)	A test used to analyze a control and tributary DSU, and the circuit between them in both directions independently. each DSU sends the same pattern and checks the incoming pattern for errors.

errored second	A performance measurement reported during Digital Test or Transmit Test Pattern that is defined as a second in which at least one error has been detected.
facility alarm	A failure condition reported to the 6700 Series NMS when there is a break in communication with one or more tributary.
fallback	Retraining of a V.32 DBM at a lower rate or speed.
FCC	Federal Communications Commission. Board of commissioners that regulates all interstate and foreign electrical communication systems that originate from the United States.
Front-End Processor (FEP)	A communications computer associated with a host computer that manages the lines and routing of data through the network; it is the data terminal equipment (DTE) at the control DSU.
generator	A circuit in a DSU or in external test equipment that produces a continuous string or stream of known data patterns.
IEC	InterExchange Carrier. A company that provides inter-LATA (local exchange carrier) telecommunication services, like AT&T, MCI®, and Sprint®. Access to these services can be provided through DDS dedicated channels, T1.5 dedicated access channel, or digital switched access (DSA) channels.
ITU-T	The Telecommunications Standardization Sector of the International Telecommunications Union, an advisory committee established by the United Nations to recommend communications standards and policies. Before March 1993 it was called CCITT.
LADS	Local Area Data Set (also called a limited-distance modem or LDM). This refers to a mode of operation where the control and tributary DSUs are directly connected but not passing through a DDS network.
Lamp Test	A test to verify that all status indicators and the control panel's LCD are operating.
LATA	Local Area Transport Area. A region served by a local exchange carrier (LEC) that consists of one or more area codes.
LCD	Liquid Crystal Display. A thin sandwich of two sealed glass plates containing liquid crystal material. When voltage is applied, the amount of light able to pass through the glass plates is altered so that messages may be "written" on the display.
LDM	Limited-Distance Modem (also called a local area data set or LADS).
LEC	Local Exchange Carrier. A company that provides *intra*-LATA (local exchange carrier) telecommunication services, like NYNEX or Bell South.
LED	Light-Emitting Diode. A light or status indicator on the diagnostic control panel (DCP) that glows in response to the presence of a certain condition (e.g., Alrm).
link-level address	NMS communications are directed to a tributary via a link-level address. It takes the form of control network address/tributary network address (e.g., 157/04 – DSU control address of 157 and tributary address of 04).

Local Loopback	A test used to determine whether the DSU's DTE connection and the DSU are operating properly. The DSU must be connected to the DTE for this loopback to be run.
LSD	The state of the received Line Signal Detect lead, also known as *carrier detect*.
multipoint circuit	A data network circuit that uses multipoint transmission and consists of one control with multiple tributaries.
Network Management System (NMS)	A set of diagnostic and configuration management tools for a data communication network, consisting of software programs and dedicated computer hardware.
non-disruptive diagnostics	Diagnostics that are transmitted over the in-band secondary channel or routed through a DBM in Standby mode so that bandwidth assigned to the data is not affected.
non-disruptive session	Executing the command will not disrupt primary data.
option sets	Sets of configuration options (or libraries) that are related and that fulfill a specific function. For example, the Diagnostic (Diag branch) configuration options allow you to configure the DSU for performing diagnostic functions. This option set (or library) contains 16 configuration options related to the DSU's or DBM's diagnostic operation.
permissive interface	A dial modem operating mode characterized by a fixed output power level of –9 dBm. It is one of two possible operating modes for a DBM connected to dial lines (see programmable interface).
physical address	The shared diagnostic control panel (SDCP) address of a Model 3551 DSU derived from its carrier address and physical slot number.
point-to-point circuit	A data network circuit with one control and one tributary.
primary core	This is the circuit card function that is normally running when power is supplied to the unit.
programmable interface	A dial modem operating mode characterized by an output power level (–12 to 0 dBm), set by a programming resistor in the datajack. It is one of two possible operating modes for a DBM connected to dial lines (see permissive interface).
PSTN	Public Switched Telephone Network (also called the *dial network*).
rate adaption	Used when the DSU or DBM operates at a speed greater than the DTE. This capability is enabled automatically when the port speed is set lower than the line speed.
rear connector plate	A plate that contains two DTE connectors and is installed on the COMSPHERE 3000 Series Carrier. The rear connector plate allows the removal of a Model 3551 DSU from the front of the carrier without having to disconnect the DTE cables.
receiver	A circuit that accepts data signals from a transmitter.

Remote Digital Loopback (RL)	A test typically used when testing an external device. A test message from the external device is looped back from the receiver to the transmitter in the remote device, then returned to the local DSU. An RL puts the remote DSU or device into Digital Loopback.
RTS	The state of the Request-to-Send lead.
RXD	The state of the Received Data lead.
session disruptive	Application data may be disrupted when running a test, or running the test may cause the application session to be dropped or terminated. The result depends upon the front-end processor, the time-out parameters, etc.
session-nondisruptive diagnostics	Diagnostic messages with a duration of .5 seconds or less that are sent over the primary data channel. These messages may interrupt customer data, causing errors requiring retransmission of data blocks. They should not, however, cause termination of the communication session.
Shared Diagnostic Control Panel (SDCP)	A feature that allows carrier-mounted DSUs to share the same control panel. Installed on one COMSPHERE 3000 Series Carrier, it controls and monitors the DSUs in all the carriers in the cabinet. A single SDCP can control up to eight carriers, with a total of 128 DSUs and, if present, 128 DBMs.
Shared Diagnostic Unit (SDU)	A circuit card that plugs into a dedicated slot (slot 0) in the COMSPHERE 3000 Series Carrier to provide the shared diagnostic control panel (SDCP) and network management interfaces to the DSUs in the carrier. It translates the network management protocol to the devices in the carrier and routes incoming messages to the appropriate slots.
standalone	The Model 3550 DSU which is designed for desktop operation. A standalone DSU can be configured as either a control or a tributary.
Time Division Multiplexer (TDM/Flex)	A circuit card that supports time division multiplexing on two ports, and which can also increase digital-sharing capability.
training	The process of negotiating a communication rate between V.32 modems during call setup.
transmitter	A circuit capable of generating, modulating, and sending a signal for communication, control, or other purpose.
tributary	A DSU or modem that is, for diagnostic purposes, at a logically subsidiary level in a hierarchical network. Tributary DSUs in a network receive data from the control DSU, as well as from any network management system present in the network.
TXD	The state of the Transmitted Data lead.
UL	Underwriters Laboratories, Inc.
USOC	Universal Service Ordering Codes.
6700 Series Network Management System (NMS)	A Paradyne automated network management system that allows an operator to monitor network conditions, analyze problems, and take restorative measures from a single personal computer (PC) workstation. This NMS operates in a Microsoft® Windows™ graphic environment.

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